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JOURNAL *of* FARM ECONOMICS

PROCEEDINGS NUMBER

Published by

THE AMERICAN FARM ECONOMIC ASSOCIATION

Volume XXIV FEBRUARY, 1942 Number 1

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Price: $5 per year, this issue $2.00

Entered as second class matter at the post office at Menasha, Wis. Acceptance for mailing at a special rate of postage provided for in the Act of February 28, 1925, paragraph 4, section 412, P. L. & R., authorized November 27, 1931.

JOURNAL *of* FARM ECONOMICS

Volume XXIV

1942

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JOURNAL
OF
FARM ECONOMICS

Vol. XXIV February, 1942 No. 1

ADAPTING AGRICULTURAL PROGRAMS FOR WAR NEEDS*

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THE SCENE is changing so rapidly that it seems almost foolhardy to analyze agricultural programs in the light of war needs for agricultural products, but we cannot escape the necessity of grappling with the problem. The job is analogous to the war plans of the War Department. The Army must be prepared for surprise moves by the enemy and therefore must plan for any situation that may develop. By comparison with other war planning, the job of adapting agricultural programs for war needs does not seem quite so difficult.

In fact, the reality of war has simplified the job. We can now concentrate on an "all-out" effort in food and fiber production to meet our own military and civilian needs and those of our allies under all possible contingencies. Even in this situation, small supplies of some products such as oil crops, cheese, and evaporated milk represent a real challenge to our productive genius, while supplies and productive capacity of others like cotton and wheat are more ample. In this emergency we have many immediate tasks. National agricultural programs should be planned in such a way that they can be quickly shifted to meet any unforeseen changes in the situation. The 1942 production goals are now being revised in

* The author has received many helpful contributions to the development of this paper from his colleagues in the Bureau of Agricultural Economics. Special mention should be made of suggestions by F. T. Hady, R. L. Mighell, W. F. Finner, K. L. Bachman, H. L. Stewart, R. C. Tetro, Neil W. Johnson, C. W. Crickman, and R. P. Christensen who, along with many others, have been working during the past year on the problem of regional agricultural adjustments for the war emergency. The author alone is responsible for interpretation of the various suggestions. The specific proposals made in the paper should be considered as personal and preliminary proposals that are advanced for discussion purposes rather than as reflecting a Bureau or Department viewpoint on the problems under consideration.

the light of recent developments. We must plan to supply the kind and quantity of food and fiber that may be needed by American expeditionary forces, and for increased shipments to our allies under the lend-lease programs. This means planning for "stock piles" or reserve supplies of all storable commodities.

Major Premises

Several major premises should precede any analysis of the type of programs needed:

(1) Winning the war is now the most important problem, and primary consideration in development of agricultural programs must be given to provisions that will contribute whatever is necessary to meet war needs.

(2) A war program of the scope and magnitude that we must visualize today cannot be carried out without involving real sacrifices by all citizens of this country. Farmers must expect to bear sacrifices proportional to the rest of the population. If in any area or line of production they are called upon to bear much greater sacrifices than other groups of citizens, arrangements should be made insofar as possible to compensate them for the additional burden.

(3) The war situation requires a rigorous examination of present agricultural programs in terms of their adequacy for the job to be done, and additional legislation may be necessary to accomplish the job.

(4) As a given proposal is being tested to determine its effectiveness to carry out the war job, it needs also to be examined concerning possible favorable or unfavorable effects on farmers or on other sectors of the economy (a) during the emergency, and (b) in the post-war period. Preference should be given to lines of action which can be adopted quickly and smoothly, and yet leave the economy in the best position for post-war readjustment. In many areas emergency programs can be developed which actually will promote adjustments in agriculture that are desirable both from a war and long-term point of view.

(5) It is assumed that the number of people who will be supported in agriculture in the post-war period should not be more than the number that will have an opportunity to obtain an adequate living from agricultural production. This requires that means be found to continue nonfarm employment opportunities for the

people that are now being attracted to war employment and for the farm youth growing to maturity that will not find an opportunity to make an adequate living on the farm.[1] If this assumption is valid we need to open up one-way traffic lanes of escape from congested rural areas during the war period, and to provide nonfarm employment opportunities later to take the place of war work. Work in war industries plus military demands on rural youth also means that labor shortages will develop in most commercial farming areas during the emergency, and that steps should be taken to minimize the ill effects of labor scarcity.

(6) This paper also assumes that some form of price legislation will be enacted, and that inflationary tendencies will be at least partially controlled. Overextension of credit in agriculture for repayment in the post-war period, and speculation in land must also be prevented.

(7) The war emergency period is considered as including not only the duration of the present conflict, but also at least a 2-year period of world readjustment following the war. In the immediate post-war period stock piles of food will be needed to "help write the peace."[2] This assumption reinforces the necessity of plans for emergency stock piles of all storable commodities. On this point Secretary Wickard recently made the following statement:

"The program of buying, or obtaining through loans, some of the vital foods which can be stored, offers still another means of reducing the farmer's risk of turning out price-breaking surpluses . . . The risks are far greater if we produce too little than if we produce too much. We're going to take whatever risk there is in producing abundantly. If we do I'm positive that the American people will not let us farmers down.

"Of course, we ought to be rational about farm production and not waste scarce labor and scarce steel and scarce chemicals in producing things that we already have in abundance. But in the production of the things that we've got to have to serve the national interest, we just can't afford to risk having a little too little. . . .

"Our goal for the post-war years must be to join as free men, each of us in all lines of production, to turn out enough of everything even at the risk of turning out a little too much. So long as there

[1] Nonfarm employment might desirably involve rural living but nonfarm work.
[2] Despite the lack of planning for transition to peace in World War I our agricultural exports remained on a high level in 1919 and 1920.

are hungry people and people needing the necessities of life in this country of ours, there is no such thing as too much in industry or agriculture."[3]

Achievement of Increased Production and Its Repercussions

Secretary Wickard's statement gives the clue that is needed to prepare for an "all-out" effort in agricultural production. In the first place, the national cost of food preparedness is minutely small in relation to the total cost of our war effort. And it may turn out to be our most vital contribution. We need to conquer the fear that has been generated by the surpluses that have plagued us so consistently for the past 20 years, and strike out boldly to provide adequate food supplies—for current consumption, for war needs that can now be foreseen, and for stock piles of storable commodities to meet unforeseen needs. We also need to plan carefully to determine where and in what commodities still further increases can take place if necessary. We must also consider the local processing and marketing problems that will arise as a result of changes in production.

Of course, a realistic answer is needed to the question of what will happen to farmers after the war and the immediate transition period are over if they greatly increase production in response to present needs. One part of that answer is that a "food for health" program may be needed after the war to replace our present "food for freedom" program. We are not likely to make all of the needed progress on better diets during the emergency. The volume of food production will not be large enough to do that and at the same time provide the necessary military and lend-lease needs. High prices also are likely to retard increases in consumption.[4] Bolstering the diets of low-income people therefore will take up part of the slack when the war is over. But the question will be answered more significantly by whether we have learned from our experince since the last war the lesson of maintaining employment and purchasing power of consumers in this country during the transition from war to peace.

[3] Claude R. Wickard, The farmers' part in making the America of the future. Address at the 75th Anniversary Meeting of the National Grange, Worcester, Mass., November 13, 1941, p. 9.

[4] There is considerable evidence that the rapid rise in prices of butter and cheese during the last half of the past year has reduced the volume of consumption below the levels of the same period in the previous year despite a larger total consumer expenditure for these products.

In order to get some measure of the extent of the need for farm products under a "food for health" program that would provide reasonably adequate diets for the entire population we can estimate the food and fiber needs of our present population in terms of the "moderate cost adequate diet" suggested by the home economists.[5] If we also assume the same level of exports as in the period 1935–39 we come out with a total volume of needed farm production 16 percent higher than the 1935–39 period.[6] This does not allow for increases in population, for increased industrial uses of farm products, or for possible increases in exports above the 1935–39 levels. We should look forward to more world trade in the post-war period, but this may call for imports of some agricultural products to offset larger exports of some others.

If the situation at the present time is at all analogous to World War I we need to fear more the possibility of agricultural production not increasing sufficiently to meet war needs than we do the pilling up of unmanageable surpluses. Despite the stimulus of highly inflated prices in the last war—prices that rose faster and farther than farm expenses—there was no startling increase in the total volume of farm production. From the period 1910–14 to 1918–19 the total increase was about 8 percent.[7] If our lend-lease exports were to double in volume, this alone would call for an increase of 6 percent above the high production levels of 1941. Our own military needs for food will be stepped up materially. We also need to consider how our food supply would be affected by another drought in 1942 like that of 1934 or 1936.

We are not likely to repeat all the experiences of the last war. We then found it necessary to plow up the prairie sod to raise more wheat. We had "wheatless" and "meatless" days. This time we not only have plenty of wheat; we also have a farm plant that from the standpoint of land requirements is adequate to produce the products that are needed. However, the quantities of other productive resources may be sufficiently limited and high in price to act as effective brakes on increases in production. Farmers will feel a more acute pinch on labor than in the last war. Military and civilian war employment will draw ever-increasing numbers of

[5] Prepared by Hazel K. Stiebeling, Bureau of Home Economics, U.S.D.A.

[6] Calculated on the same basis as the revised BAE index of volume of agricultural production.

[7] Computed from the revised BAE index of volume of agricultural production. There was of course a large increase in wheat acreage.

young men from farms. Machinery which would substitute for labor will be scarce, and because American farms are more highly mechanized today than they were in the last war, more equipment will be needed for replacement of worn out machines. Thus, there may be little opportunity to substitute machinery for labor in order to step up production. As the war progresses, fertilizer, spray material, and other farm supplies will also become scarce.

Of course, it would be relatively easy to get increased production along some lines under our present price-supporting programs—in wheat and cotton, for instance. But so far as we now can foresee, we do not need increases in these crops. At least we need greater increases in livestock products, in oil crops, and in fruits and vegetables,—increases that will be quite difficult to get. In dairy production, for instance, the length of the production cycle for cow numbers places an upper limit on increases within a given period.

The fact cannot be overemphasized that to get increased production in the farm products that are most needed, considerable shifting of enterprises will have to take place on the farms of this country. Therefore, our farm programs need to effect those shifts without jeopardizing unnecessarily the long-time farming possibilities of the areas concerned. They also need to take advantage of the unused capacity of individual farms and farmers.

In the past year we have heard the statement many times that if farm prices are sufficiently high we need not worry about the volume of farm production. The writer is quite willing to recognize that high prices can stimulate production of products that have a short production cycle; unless they are offset by costs rising even more rapidly or by other factors, such as a serious shortage of labor.[8] To get a planned increase in the *total* agricultural output is an entirely different problem, especially when it involves much shifting of farm enterprises. Rapidly rising and extremely high agricultural prices can also set in motion some very undesirable forces that may result in tragedy for farmers as a group. This paper is not intended as a discussion of the general inflationary aspects of rapidly rising farm prices, but it is difficult to refrain from mentioning that there would be no easier way to alienate the support of other groups for reasonable agricultural programs than to give

[8] But production will be stimulated by the high prices of the previous crop, i.e., after the shortage has already occurred, and this may set in motion shifts that cause shortages in other lines.

justification for an outcry about the "high cost of living." Effects almost as detrimental would be exploitation of soil resources that result in irreparable damage to the farm plant, and overinvestment in land and capital equipment that would constitute fixed charges in the low price period that would inevitably follow.

To prevent such a catastrophe we need to think about ways in which the adjustment machinery developed in the depression emergency can help carry through the war emergency. Adapting these programs to our present problems does not consist merely of throwing the production control machinery into reverse gear. We still need controls for cotton, wheat, and tobacco, but we also need active stimulation of production of dairy products, oil crops, etc. As a matter of fact, some of the needed increases will compete with each other, and the respective stimulants will need to be carefully administered to get proportionately desirable effects.

Program Adaptations

In adapting our agricultural programs for the war emergency perhaps we can apply one of the oldest institutional devices that we have for regulating farm production—the "classified price" plan under which milk going into difierent uses receives different prices. This approach can be combined with our experience in making individual farm allotments under the AAA program. We can establish for each farm a "base production allotment" both for such surplus crops as cotton and wheat and for the deficit products, such as milk, meat, oil crops, and vegetables.

Application to War Deficit Products

A classified price plan for deficit products would involve paying a higher price for the additional or "war production" than for normal production as reflected in the "base production allotment." The "base" for each farm would be established as an individual farm share of normal domestic consumption of the product considered. The way in which it should be determined for each farm will be discussed later. Farmers would understand that this "base" represented their share of the normal demand for dairy products, for instance. But because of the war emergency we need much more than normal production, and the question becomes one of how to stimulate the desired increase.

Farmers may be well satisfied with present (or parity) prices for

their normal production but these prices may not be sufficiently high to make it worth while to increase production above normal output. The additional return to the farmer should therefore be sufficient to pay for all costs directly attributable to the increase plus whatever incentive is needed for his risk and effort in producing the increased product. It is important that farmers realize the source of the increased demand; also the likelihood of its temporary nature. But realizing that, they may be more reluctant to expand production unless adequate incentives are provided.[9]

In dairy production it would appear to be most feasible to make a special payment directly to farmers at the end of each month or each quarter in proportion to their increase above the "base production allotment." This would then constitute a bonus payment per unit of output above the normal production.[10]

It should be noted in passing that this proposal, i.e. providing higher prices for the additional or "war production," can be reversed if a surplus situation develops after the war. The government could offer a market at a much lower price for the output in excess of the normal production in order to tide over a transition period. Purchases of that type would be disposed of outside of "normal distribution channels."

Application to Surplus Products

For the surplus crops, such as cotton and wheat, the "base production allotment" again would be the individual farm share of domestic consumption. Applying the proposal to cotton, the farmer's "base production allotment" would be eligible for the 85 percent of parity loans provided by recent legislation.[11] "Base production certificates" should be required for the disposal of this part of the cotton crop. "Surplus" cotton, or the amount produced in addition to the "base production" could be purchased by the government at a very low price—say 5 cents per pound. It would be diverted into byproduct uses, into noncommercial channels, or

[9] Incentives for increased production may need to include not only adequate payment for current additional costs, but also an advance guarantee of minimum payments over a period that covers the length of the production cycle.

[10] F. T. Hady, who first suggested to the author the price separation of "war production" of agricultural products from "normal production," advanced the possibility of directly contracting with farmers for purchase of the increased output. See "Farming adjustments in the Corn Belt and Lake States to meet defense needs," which was prepared under the direction of F. T. Hady, for another discussion of this proposal.

[11] Which, of course, recognizes changes in basic price-cost relationships.

possibly to export. If too much "surplus cotton" were produced even at such a low price it might have to be lowered even further, or the offer to buy surplus cotton could be limited to a certain ratio of the base production allotment.

In the cotton areas where there are other production alternatives another attack on the surplus problem would of course be additional payments for the production of soil-conserving crops and other alternative enterprises of which we need increases in production. This point will be taken up later.

In the case of wheat the application of the "base" and "surplus" production principle would be relatively easy because there already exists a wide market for the surplus wheat as a livestock feed.[12] A "base production allotment" would be established for each farm in relation to domestic consumption for food uses. Certificates would be issued to each producer for the marketing of this "base production," which would be eligible for the 85-percent parity loans and for purchase by millers, with the provision that marketing certificates accompany each purchase.

The surplus wheat could be fed on the farm or marketed as feed at a price comparable to other feed grains. With "surplus wheat" at feed prices other feed grains probably would be produced wherever they yielded more feed per acre than wheat. Aside from the amount that might be needed for export the "surplus wheat" to be marketed without certificates could be marked in some way to prevent its reconversion for food use.[13]

Determining Base Production Allotments

So far we have not been concerned with how the "base production allotment" for surplus or deficit products should be determined for each farm. They could of course be established mechanically—on the basis of historical production, or the percentage of cropland. The best method would be to work out with the operator of each farm a long-time farm plan which would consider the need for soil conservation practices, and the kind of crop and livestock

[12] R. L. Mighell and Einar Jensen in the spring of 1941 proposed a "feed materials program" which involved disposing of surplus wheat for dairy feed at relatively low prices to producers who increased dairy production. The income effect of such a program on dairy farms would be similar to paying a higher price for additional dairy products. Mighell has recently restated this suggestion in terms of a classified price plan for wheat similar to the above proposal.

[13] It could be colored, mixed with rye, or cracked if a long storage period is not required.

organization that would best fit the farm under more normal circumstances. From such a plan the "base production allotments" would be derived for each farm.

Only by adjusting "base production allotments" to the land resources on individual farms can adequate recognition be given to the wide variation in need for soil conservation, and therefore to the desirability of expansion or contraction of soil-depleting crops. In that way smaller bases for soil-depleting crops would be established on farms with rolling land and thin soil than on farms with deep soil and level land, where there is less possibility of soil damage. Additional payments for increasing production of deficit soil-depleting crops, such as soybeans, should also be limited on the farms with poorer land. This means that the lack of opportunity to share in "base" and "war production" privileges attached to soil-depleting crops would need to be offset by relatively larger "base" and "war production" of roughage-consuming livestock, and by additional payments for soil-conserving practices.[14]

In the early years of the agricultural programs it probably would have been impracticable to try to establish bases on individual farm plans. However, with the experience gained in historical approaches to acreage allotments, the land productivity inventory made by the AAA in the North Central Region in 1938; and with the experience of the SCS, the FSA, the BAE, and the agricultural colleges in farm planning; and the nationwide intentions canvass recently completed; the stage should be fairly well set for an individual farm plan approach. If all the forces that can make a contribution to this problem are mobilized—the farmers themselves, the farmer committeemen, and the technical agricultural workers—the job can be fairly well done. If only a part of the SCS, FSA, state college and Smith Hughes workers who are familiar with the farm planning problem were assigned to this job, perhaps as many as five or six farm planning specialists might be available in each county to work with farmers and farmer committeemen. The job, of course, needs to be carried out with as much objectivity as possible. Similar situations need to be given the same type of treat-

[14] Evidence that this problem becomes extremely important as we swing into "war production" is the fact that the same corn acreage as 1941 plus 1942 production goals of soybeans for grain gives a total of these two soil-depleting crops that is 7 to 8 percent larger than their combined acreage in the 1928–32 period for the states of Illinois, Indiana, and Ohio.

ment.[15] From that standpoint the job is analogous to local assessment for taxation.[16]

Payment Rates

A difficult part of a program of this type would be to arrive at satisfactory rates of payment for "surplus" and "war" production, and for soil conservation practices that will shift farm production in the direction that it should take for the war period and its aftermath. The rates of payment for surplus products should be in line with the possibility of disposing of them in byproduct uses, or in desirable noncommercial channels. To establish higher prices than that would mean encouragement of waste and inefficient production at a time when we cannot afford it.

Sample budgets worked out on two-mule farms for some areas of the South indicate that with 5 cents per pound for "surplus cotton" lint and with present prices of $50 per ton for the cottonseed, production of "surplus cotton" might compete effectively with alternatives such as dairy products at 30 to 35 cents a pound for butterfat. In areas where peanuts and soybeans can be grown these would be more profitable than other alternatives to cotton. The source of the competitive advantage of "surplus cotton" at the present time is largely the high price of cottonseed. At 1939–40 prices of about $25 per ton, other alternatives would compete more easily with 5-cent cotton lint. However, if a purely byproduct market is available for cotton lint at 4 to 5 cents per pound perhaps we can afford to take a part of our increased needs for oil from cottonseed.[17] Before we make that decision, however, we should consider the need for soil conservation in many areas of the South and whether, from the standpoint of that need, greater encouragement should not be given to hay, small grain, and pasture crops.

Payment for "war production" in the deficit products should be adjusted to the steepness of the curve of additional costs that need to be incurred to produce the increased output, with perhaps some

[15] The problem of bringing in new producers would be simplified because the "base production allotment" would be determined by the long-time farm plan. For the deficit products, new producers should of course be encouraged providing the enterprise fits into their farming system.

[16] Incidentally, it might help to furnish a basis for more equitable assessment.

[17] Assuming cotton yields in the Mississippi Delta of 350 pounds lint and 744 pounds of seed per acre, and soybean yields of 15 bushels, or 900 pounds per acre, the cottonseed would yield about 115 pounds of oil as compared with 135 pounds of soybean oil.

additional remuneration to get the job done. It should be understood that this curve will have a higher level in a period of relatively high prices and satisfactory incomes such as the present, than the marginal variable expenses curve that determines the volume of output on most farms in depression periods. Under depression conditions many farmers may increase production if the income for the additional product yields any net return above the directly attributable cash outlay.[18]

The marginal cost curve that farmers consider in deciding on increased production in more satisfactory income periods may need to cover a charge for better maintenance of buildings and machinery, and perhaps the purchase of new equipment, such as a milking machine. The farm family may demand a higher return in order to work harder for the increased output, unless this is stressed as a patriotic duty. Depletion of soil resources is likely to be watched if the farmer is sufficiently aware of the damage being done.

A preliminary check on some farm budgets for Wisconsin dairy farms indicates that, assuming October 1941 prices and costs for both quantities of output, there would be little income advantage to farmers in increasing production above the 1941 levels in order to meet the 1942 production goals.[19] However, if the price of the additional output were increased 25 per cent, farmers would find it worth while to meet the goals.

The 1942 production goals for Wisconsin suggest an increase in milk production of 13 percent over 1941. If the price of the additional output were set even as high as 50 percent above the October 1941 price, it would mean only an increase of 5.6 percent in the composite price for all the milk sold. Thus the inflationary effect would be slight as compared with an increase of, say, 25 percent in the price of the entire output. Nevertheless, the costs directly attributable to the increased output would be adequately met, including an additional return to the operator.

The exact rate of payment that should be made for the increased product will of course depend partly on the percentage of increase desired in relation to the present intensity of production on the bulk of the farms in a position to increase output. If there is con-

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[18] Sherman E. Johnson, "Farm management problems in an era of change," 1940 Yearbook of Agriculture, pp. 492–495.

[19] If costs rise faster than prices in the coming year it may actually pay better to produce an even smaller volume of dairy products than in 1941.

siderable unused capacity in the form of land, labor, and equipment, the additional costs will be very low per unit of increase. On the other hand, if, on a dairy farm for example, the family labor is fully employed, and if little more home-grown feed can be produced, and there is no barn room available for an extra cow, the additional costs obviously will be much higher. The operator may also encounter physical diminishing returns from heavier feeding, and the risk of increased production is somewhat greater. Thus a much higher return will be needed for the increased output as we approach the limits of more intensive use of land, labor, and equipment resources.[20]

A part of the remuneration for increases in livestock production should come from the encouragement of soil-conservation practices, especially on the thin rolling lands. Payments for growing more legumes and for pasture improvement will increase efficiency of livestock production and at the same time encourage the kind of farming that will maintain the productivity of the soil in those areas.

Rates of payment for soil conservation and for soil improvement in the poorer land areas should be determined partly on the basis of offsetting the higher immediate returns from soil-depleting crops and practices. In other words, they should provide definite encouragement for shifting in the direction of hay and pasture on the poorer lands. The margin of profitable shifting will be reached more quickly in the poorer areas because the yields of soil-depleting crops are relatively lower.[21]

Special mention should be made of the range areas of the West where there is very little elasticity in the intensity of production, and therefore little opportunity to increase output. There are no alternative uses for the land, and to avoid periodic disaster livestock numbers need to be limited to the normal carrying capacity of the range and the winter forage supply. A program for that region should involve payments for holding livestock numbers on

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[20] If much new investment for machinery, buildings, or land improvement is required to increase production, emergency credit should be granted, with provision for amortization from income in the war period. Farmers supplying fresh milk for army camps need credit of this type.

[21] We may reach a stage in our war effort where we cannot afford to expend much of our present income even for soil maintenance. However, we should avoid unwarranted soil depletion and make the expenditure necessary to avoid irreparable soil damage that will seriously reduce our production efficiency in the post-war period.

private lands in line with the feed supply, and regulation to prevent overgrazing on the public lands.

Programs for Low-Income Farmers

In this discussion very little has been said directly about low-income farmers and about submarginal land areas. In the areas where farm incomes are low because of too high a ratio of population to land resources the most important program that can be developed is to train young people for both farm and nonfarm employment, and to assist them to find work elsewhere at a time when such opportunities exist. This will require considerable improvement in both our training and placement programs.[22]

A training and placement program becomes especially important in areas where the land resources are hopelessly inadequate for the support of farm families. In such areas it should be supplemented with a public land purchase program that, in humid areas, would provide life tenure for the present operators.

The need for individual farm planning has already been stressed as a part of the adjustment program. Competent assistance in planning their farms to obtain maximum advantage from present income opportunities can easily become the most important public contribution that can be made to low income farmers as a group.[23]

Payments for conservation practices and soil improvement can be adjusted to fit the special needs of the smaller farms. Often assistance will be needed to obtain adequate machinery and livestock to take full advantage of present production opportunities. Loans for such purposes should be amortized over the emergency period. Frequently more land will be needed before an adequate income can be obtained. In areas where some farmers are moving out to take advantage of defense employment it sometimes will be possible to enlarge the operating unit. Where land resources are insufficient even a doubling of farm prices will not give adequate incomes.[24]

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[22] Training and placement for farm work in commercial farming areas could help materially in relieving the labor shortage. However, commercial farmers will have to compete with war industries for this labor, and they must realize that farm wages will go much higher as the labor shortage intensifies.

[23] Sherman E. Johnson, "For farm consultants," Land Policy Review, August 1941.

[24] On two-mule Lower Piedmont cotton farms the net cash income expectancy with average yields has increased from about $250 in 1940 to $450 in 1941. This is still not a princely income, but there is of course the added question of the present operator's ability to handle a larger farm in a way that would increase the income to the family. Competent management assistance may be needed.

Assistance in providing home-grown foods, in caring for health and school needs, and in training the young people for new ways of farming, or for other occupations are likely to continue to provide outstanding opportunities for assistance to the majority of low-income farmers.

Summing up

There is little in the foregoing discussion that is really new. Some proposals involve different combinations of devices that have been used during the last 8 years, or even over a longer period. However, in the present emergency one of the most important jobs is that of combining the use of these devices in a way that will facilitate the adjustments in agricultural production that are needed in view of the rapidly changing world conditions—needed for the protection of farmers and for the nation's welfare. The particular use suggested of the "classified price plan," when combined with payments for soil conservation practices and with other devices, seems to offer an improved method of facilitating production shifts in nationally desirable directions; while at the same time providing adequate incomes to farmers.

In the post-war period, as well as in the present war emergency, the agricultural industry must make its proportional contribution to national welfare. Agricultural policy and programs therefore must be developed to meet the final consumption needs of our population for farm products. As previously mentioned, this may require a "food for health" program to take the place of our present "food for freedom" program. By providing adequately for the food and fiber needs of all the people, the farm group will earn an opportunity to enjoy real incomes proportionate to the remuneration of other groups in the population; also the right to some protection against undue risk in performing that function.

Determining in advance of the production period the amount of a given product that is likely to be needed (as in the 1942 production goals program) and then setting a minimum price for the "base production" of that product on individual farms will go far toward providing adequate incomes and insuring farmers against undue risk. Payments for quantities in excess of "base production" then become the guides, or the incentives, for shifting from the products of which we have a surplus to those which should be increased in the national interest. Payments for conservation prac-

tices can reinforce the other incentives for shifting. It is recognized that the present commodity loans, surplus purchasing and disposal programs will need to be used as part of the machinery for carrying out such a program.[25]

In conclusion, it appears that the combination of devices that has been suggested for the war emergency may also be useful in the emergency of transition from war to peace, and even in the post-war period. One thing seems certain, the scene will change quickly, drastically, and unpredictably. Therefore, farmers will need the assistance of government programs to tide over the transition. If we can manage somehow to widen the channels of world trade, to maintain a fairly high level of nonfarm employment, and to gear agricultural programs to the consumption needs of the population, we can probably make the transition without a return to the "general shrinkage" philosophy of the Thirties. If we succeed in that we can finally get on an "improvement level" that will require a general expansion of production in our economy, including the output of agricultural products.[26]

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[25] It is recognized that these devices may not be needed for all products.

[26] See "Analysis of interregional competition in agriculture," BAE mimeograph, April 1939, Part IV, pp. 66–74.

AGRICULTURAL PROGRAMS FOR THE POST-WAR PERIOD

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SOME estimate of probable economic and social conditions which are likely to prevail in the post-war period must be made, before we can make any progress in suggesting the nature of agricultural programs for that period. One thing we know is that the nature of the agricultural programs will be determined in large measure by the character of the whole economic and social structure.

We can judge the nature of the distortions in our economy which the war will bring, but we cannot judge their extent. Following is a brief prospectus of probable conditions at the close of the war, starting with the items which seem certain and progressing to those more doubtful.

1. When the war is over, we will have a continuance of the problems of soil conservation, land use, low income farmers, tenancy, land inheritance, and the problems associated with credit and land ownership, probably in aggravated form.

2. We will have something more than one-third of our total workers engaged in war activities. One of the most pressing immediate problems at the close of the war will be the transfer of this great mass of workers to peace-time pursuits. A satisfactory solution to this must be found before a beginning can be made in rebuilding a balanced national economy which will provide a domestic market for agricultural produce.

3. Our entire economy will be badly distorted. Even if extreme price inflation is avoided, the substance of inflation remains. The problems of economic reorganization for peace are overwhelming. To the extent that competition still remains, reorientation may be prompt but drastic. To the extent that the control of the economy has passed into the hands of bureaucracies, the reorientation is likely to be slow, fumbling and confused. Most nations seem destined, at least for the war period, to accept a degree of totalitarism. Can an economy of this type, once it gets wound up for war, hope

[1] The writers wish to make acknowledgment of the suggestions and criticisms of R. H. Bauman, E. L. Butz and T. K. Cowden of Purdue University and J. B. Kohlmeyer and Arthur Mauch of the Bureau of Agricultural Economics.

to unwind for peace without drastic reorganization? Can it do so as expeditiously as a free economy? It seems very doubtful.

4. The world will need both consumption and production goods for reconstruction. Lend-lease machinery, no doubt for a short time, will take care of these demands provided we ourselves are not exhausted. The final test for most economic planning will come when lend-lease operations stop, as they must some time.

5. World trade will be disorganized. We may be able to expand our trade if we as a nation so choose and if the world economic organization will permit it.

6. There will be a high price level with its associated problems of indebtedness, high fixed costs, disparity of income between groups, and other difficulties arising from rigidity within the price structure.

7. Within our own nation we will close the war with a depleted inventory in consumption goods and a depleted productive plant both in industry and agriculture. The extent of this depletion cannot be estimated at this time.

8. There will be dislocation between the supply and demand for certain agricultural commodities.

9. People will be psychologically prepared for Government programs. However, there is always the possibility in the event of a long exhausting war that people may become completely disillusioned and revert to a simpler economic life with less rather than more central planning.

10. There are likely to be fundamental changes in the nature of our economic and social structure that may require an entirely different approach to problems of reconstruction from any now contemplated.

11. There no doubt will be many technological advances made during the war. From some of these may come opportunities to develop new peace-time industries.

So far we have listed only the items in our post-war budget of grief. It still remains to fill in the numbers and value columns. Here we must deal with highly speculative considerations which make any kind of planning extremely uncertain. It seems to us that realistic planning for post-war must take into account a number of alternatives. In order to give some basis for proceeding, we have tried to state the various alternative situations which may exist. Obviously the length, extent, developments and outcome of the war

will determine the nature and extent of these economic dislocations.

These alternative situations are:

1. That the economic sequences in World War II will follow the pattern of World War I. In this case there would be a period of inflationary price increases accompanied by very great increases in farm earnings, and in its later stages with inflated real estate values. This period would be followed by partial deflation and a short period of business stagnation, then by a long period of reconstruction in which agriculture is depressed relative to industry and relative to its previous condition rather than absolutely. The final stage would be reached when lease-lend gives out. There would then come a general deflation in which agriculture would be forced to adjust itself to a new condition of equilibrium based on a stagnant domestic market. If this pattern is followed, dislocations may be expected to be more extreme than during World War I.

2. A long exhausting war in which the pattern of economic maladjustment resembles more nearly that of France during World War I. Here the sequence of economic events resembled those in the United States only in a general way. The forces of disequilibrium were so extreme as to rock the economic structure to its foundations. In France the full effect of a disequilibrium, of which inflated prices were a phase, was not felt until 1926, twelve years after the outbreak of the war.

3. That price rises will be moderate as a result of control measures. That disequilibrium will be kept to a minimum, especially through controls which prevent increases in land values and in fixed charges. That the distortion caused by the transfer from a peace-time economy to a war economy will be managed so that these distortions are not fully reflected in prices and especially in the prices of capital goods.

Will the problem of shifting from a war economy back to peace and the problems of reconstruction be handled any more expeditiously in a managed economic state than in a state where price and competition rule? It seems probable that the rigidity which is inherent in a managed economy once it has passed out of the feverish development period into the hands of the second generation would result in the period of readjustment being drawn out over a long period. It might conceivably end in a crash of revolutionary proportions. It is a mistake to believe that a controlled economy can escape the economic consequences of the disequilib-

rium created through war. Price control is merely treating symptoms. Inflationary increases in a free economy merely reflect, as in a mirror, the condition of disequilibrium which cause them.

The conclusion from this argument, therefore, is that the nature of agricultural programs in the post-war period will be profoundly influenced by the happenings between now and then. That in even the reasonably long run, we should plan programs not for the period when the effects of the war are finally liquidated but for the reconstruction period when the world finds itself exhausted in man power and resources, disorganized and disillusioned. We conclude that this reconstuction period may stretch out to "long run" proportions.

Up to this point we have been concerned with laying the ground work on which post-war programs can be built. It is obvious from this analysis that only very tentative preliminary plans can be made now. At this point the writers were faced with two alternatives, neither of which looked very promising. We could suggest a rational program based on purely economic analysis or we could suggest a more realistic program in which political expediency becomes a controlling factor. We have chosen the first one. We grant that it is probably highly academic; nevertheless, this is the way in which economists must make their contributions.

The program can be stated very simply, and it needs little explanation.

The first phase of the program deals with problems which agriculture shares with society as a whole. We would abandon, or place in a subsidiary position, the efforts to solve the problems of farming on the supply side. We would place the emphasis on distribution and demand. This obviously will involve a complete reorientation of the action programs and in many cases the elimination or relocation of the functions of these agencies. It will first of all involve some kind of compromise between economic groups, effected by democratic or other means, through which economic groups can function efficiently without exposing themselves to penalties imposed by other groups whose programs are directed toward group improvement through managed scarcity. It will involve programs for quick, efficient, economic reorganization in the reconstruction period. Practically, it means developing plans for keeping the factories running rather than shutting the farms down. It means development of practical programs for increasing the output and in-

come of groups operating at a low level of industrial efficiency. It involves programs for the development of international trade along constructive rational lines. It involves programs for effecting the transfer of capital to other nations under conditions which will protect it and insure its efficient use.

It is with reluctance that the writers have suggested this approach to the problem. It seems in the circumstances, the only alternative since the gains to be had from planned scarcity in the interest of economic groups have been shown by recent experience to be largely illusionary. The recovery of well organized economic groups during the last decade has been accomplished in the main by diverting income and opportunity from other groups more poorly organized. The continuation of large scale unemployment both in the city and in the country and the widening gap between high and low income groups in labor and agriculture amply demonstrate this point. The reason for our reluctance to approach the problem of post-war programs from the standpoint of distribution results from our analysis of the scope and nature of the programs which are likely to be necessary and from the nature of the difficulties which must be overcome. Regulation of demand and distribution is more complex than regulation of production. It is doubtful if private enterprise can survive this type of regulation. Having accepted a degree of regulation of economic life never before experienced, we seem to have no option but to go forward to still greater regulation. In so doing we must face the fact that each step taken in this direction is increasingly difficult to retrace. There is an element of irrevocability about decisions made in this connection that should give us pause.

Groups of individuals or corporations who have joined together to better their economic position naturally turn to programs of planned scarcity. The monopolistic gains to be had are about the only contribution that the group can make. The group grows and thrives on the monopolistic advantages it gains for its members. The leaders of the group draw their support from this source. If they do not deliver they are likely to be deposed, or their organization will be supplanted by another. We must be content with this statement since this is obviously not the place to digress into an analysis of monopoly.

Here we have the principle obstacle to the development of post-war programs based on the sharing of abundance. If we are to

make progress in solving our economic dilemma on the demand side, there must be some kind of compromise effected between economic groups in the interest of society as a whole. This may be done by the very direct methods of the authoritarian government or perhaps through truly democratic procedures. These procedures, like education may prove too slow for impatient leaders. If the problem is approached through planning within the framework of our present economic and social system, then partial planning or in other words, planning for agriculture alone, is not sufficient. The planning for each segment of our economic life must be geared into the total plan for our entire economy. Much of the confusion, much of the disappointment, and much of the failure for economic recovery in the past can be traced to the failure to integrate agricultural policy into general policy. Obviously, we have not yet learned this lesson well enough. While we talk in general terms about total planning, we have not progressed very far towards a practical means of making such planning effective. Is agriculture (as a political and economic pressure group) ready to subordinate its interests to the general interest sufficiently, for example, so that it will throw the full weight of its influence towards effecting full employment of labor in the post-war reconstruction period on the grounds that if this is accomplished, agriculture will share in the prosperity which will result? Even if the agricultural leaders reach a place in their thinking so they are ready to support such a program, it is doubtful if it would be practical for the reason that farmers will expect tangible direct benefits which can be credited directly to the activities of their organization.

Most planning by groups is directed towards preventing rather than effecting change. It remains to be seen whether planning in the general interest can be more constructive. Experience with agricultural planning in the last few years does not look very promising in this respect. At the township and county levels where special organized interests were absent or in a minority, land use planning has appeared very promising. When the effort was carried into state meetings and questions of broad policy affecting the agricultural agencies were involved, it became clear at once that farmer organizations and especially vested bureau and department interests were in control. The state land use planning efforts generally developed into log-rolling enterprises except in cases where one interest was in control. It is a reasonable prediction that if land

use planning is carried to the national level and anything resembling democratic representation is employed, the planning will degenerate into a pure log-rolling enterprise. We have not yet reached even the preliminary stages of total planning in which representatives of agriculture, labor, and industry attempt to integrate their plans into an over-all plan. We, are therefore, ready to suggest that, unless we get to work at once, we are likely to enter the post-war period with plans and programs and with a planning machinery not much improved over that which was available in 1933 but, with special interests more strongly entrenched. If this is the case then a revival of scarcity schemes seems very likely.

The second barrier to the approach to the demand side is ignorance. If progress is to be made in effecting a modification in the demands of groups so that they are willing to meet around the council table to compromise their differences and to plan in the interest of all, then a great deal of education will be necessary—education in elementary economic principles that reaches down into the ranks. For years the "educational" effort of the group has been pointed in the opposite direction. It is not enough to educate the leaders unless the change can be made during times when the economic pressure on the groups is not great. Otherwise, the ill-informed rank and file is likely to repudiate their own leadership. Unfortunately, when times are good and the pressure is reduced, we tend to relax our educational efforts. The result is that we do most of our planning under the pressure of emergency conditions when cool dispassionate judgments are difficult to make and when concessions to meet emergency conditions dominate all other considerations.

The third barrier to a constructive approach to the demand side is political opportunism. This includes persons who run for elective offices and persons in the colleges and the civil service who strive to make personal progress through sponsoring popular movements. Political leaders tend to rise to power on the tide of economic and social discontent. There is no political capital to be had in the quiet atmosphere that should surround the conference table.

Nevertheless, we must try along these lines. On the constructive side we have the basic good sense and spirit of compromise that is indigenous in the American people. They will not relinquish easily the gains made through technology and efficiency. The gains to be had through compromise are great. The best prospect appears to

lie in getting started with this program now. The war has offered a respite in the sense that a final decision is not immediately necessary. It is possible that given enough time, some solution will be found that will preserve the best contributions of individualism and carry it forward into the era of more complete regulation of economic life by the state. The place to start is with fundamental education in economics.

We have taken it for granted that some direct action by government will be necessary in the post-war period. We are now too hopelessly involved in regulation and the interests of individuals will have been too long subordinated to those of the government to hope even that the enterprise created through individual initiative will be sufficient to recreate an orderly peace-time economy unaided. If the program suggested in the preceding paragraphs can be carried out, it is possible that government aids in reconstruction can be limited to emergency measures or to subsidies which will not involve regulation of distribution.

The experience gained during this war may be invaluable. Perhaps after the price fixing and rationing, we are about to experience, we may be glad to revive the automatic distributive functions of a free market. Experience gained in dealing with price ceilings and rationing may serve us in dealing with post-war price floors and glutted markets.

Perhaps out of the war experience we may develop machinery for dealing with economic groups. Perhaps this time we may learn how to stabilize the general price level, in which happy event many of the problems of post-war readjustment will shrink in importance. These suggestions of lessons which may be learned from experience, however, contain more of hope than of promise.

The second phase of the program deals with the problems essentially unique to agriculture. The efforts here should be directed toward the internal problems of agriculture. If the program previously suggested could be carried out, responsibility for general economic recovery and for the farmers' share of national income would be borne by the larger group in which farmers' interests would be properly represented. This would greatly simplify the problems of the agricultural action agencies. They could then devote themselves to the technical problems of education, conservation, land use, credit, relief for low income families and reorganization of broken down farming areas and broken down farms in good areas.

There would result two groups of action agencies; the first one would deal with conservation, land use and credit. In general the functions of the Agricultural Adjustment Administration, Farm Credit Administration, and Soil Conservation Service and similar agencies originally developed to assist farmers who were solvent, should be coordinated and organized to serve commercial farmers who would continue in charge of their own affairs. Efforts of these agencies might well be directed towards effecting conservation and rational use of all the farmers' resources. They could serve as active agents in implementing good farming and good living among farmers. If this could be done with a recognition of the fact that basic social progress comes as a result of the slow processes of education, it would relieve the minds of many of us in the colleges. We should recognize that we cannot make a good farmer out of a poor one by buying him a new pair of overalls. The action agencies have shown that the educational process, at least as measured by certain good practice, can be speeded up through the use of subsidies if they are used intelligently.

The problems of depopulation of overpopulated areas, reorganization of broken down farming areas, education and rehabilitation of low income non-commercial farmers, and administration of straight farm relief would be centered in a second group of coordinated agencies set up for this purpose. The boundaries of the areas served by these agencies should be clearly defined. In general, it would be their responsibility to deal with situations in which the resources of the individual or of the community are insufficient to enable the individual farmers to work out their own problems, with their own resources. This might involve transferring some of the functions and some of the individual clients from one category to the other. It would involve for example, a complete shifting of The Farm Credit Administration and The Farm Security Administration with the transfer of borrowers and functions from one to the other. The corporations under the jurisdiction of The Farm Credit Administration would confine their operations to lending on a business basis in competition with other lenders. The seed loans, the straight commissioner's loans and some borrowers from the land banks and the production credit associations would be transferred to The Farm Security Administration.

Problems related to the economic position of farmers among economic groups, the ebb and flow of farm population, the problems of education and economic opportunity for farm youth cannot

be solved by agriculture alone. Here the interest impinges on that of other economic groups. They must be treated as problems which involve the entire society. Until we learn how to separate problems of this kind from those which concern agriculture alone, not much permanent progress can be expected anywhere.

We, therefore, again come up against the barrier which we have faced at several other points in this paper. We have reaped about all the benefits that can be expected from planning for agriculture alone. Most of these have been gained at the expense of other economic groups. Before we can proceed much farther we must learn how to subordinate group interest to the general interest without unnecessarily penalizing the group. That this can be done in a free society is doubtful. Nevertheless, having planned thus far we have no option but to face the issue. All of which leads to the final conclusion that only through research and education can economists hope to effect the actions of the politicians who will write the post-war programs for agriculture.

DISCUSSION BY R. R. RENNE

Montana State College

The problems associated with effective adaptation of our agricultural programs to war ends seems to me to be generally under-appreciated. The great majority of citizens have been led to believe the capacity of our agricultural plant is practically unlimited, and that a tremendous expansion of output over present levels can be accomplished with little effort. Curtailment programs of recent years have encouraged this belief and the high food prices of the first World War period have led many to conclude farmers would not only be very prosperous for the duration but that rising prices will automatically bring forth the needed supplies. To these people the step needed at this time is to abandon current agricultural programs and leave farmers alone.

Frankly, I cannot subscribe to these views, but on the contrary believe some very intelligent agricultural planning and leadership, amply backed up by effective government efforts are essential if we are to: (1) win the war, and (2) prevent repeating most of the major mistakes we made in the last war period. I am, therefore, in general agreement with Dr. Johnson's major premises and conclusions, and although there are numerous minor points which I feel need further explanation, and with some of which in their present form I disagree, I shall confine my remarks to two major points which I consider most significant: (1) the necessity of adopting specific measures to secure the kind and amount of agricultural products we need to win this war, and (2) the difficulties, yes practical impossibilities, of working out farm programs that will be most effective in winning the war, but which will at the same time leave the economy in the best position for post-war readjustment.

Dr. Johnson states, and I think correctly, that adapting our agricultural programs to our present problems "does not consist merely of throwing the production control machinery in reverse gear." I agree that we still need some controls for certain products and active stimulation of production of certain others. But the question which most frequently arises is why won't the price system take care of this problem? That is, if there is a much greater demand for dairy products than for wheat or cotton, won't prices of dairy products improve relative to wheat and cotton prices and cause the desired shifts in production to occur promptly and adequately? The widespread belief that favorable market price is the only implementation needed, is one of the major difficulties in the way of general agreement on the kind of an agricultural program needed at this time. Consciously and unconsciously it influences the thinking of thousands of farmers, business and political leaders, housewives, and even of many farm economists themselves. Rather careful analysis of this point, therefore, is fundamental.

Dr. Johnson has pointed out the inadequacy of dependence upon favorable prices alone, principally on the grounds that rapidly rising and extremely high agricultural prices can set in motion undesirable forces that may result in tragedy for farmers as a group. He mentions alienation of needed support of other groups resulting from high costs of living, the irreparable damage to the farm plant resulting from exploitation of soil resources, and the overinvestment in land and capital equipment constituting fixed charges in the low price period that would inevitably follow. These are very important weaknesses which in themselves should be ample to disqualify sole reliance upon favorable agricultural prices, particularly in view of our disastrous experience of the last war period. But, in addition, it is questionable whether prices alone would achieve the desired expanded production of the right kinds and amounts. In the first place, their action is interfered with—in many cases may be completely offset or neutralized—by the system of quotas and priorities that has and will be developed. Second, prices and available supplies of other production factors, especially labor, new farm machinery, and fertilizer, are such that the supply available to farmers will probably be reduced appreciably rather than increased. It is true that the stock of unused or incompletely used farm resources, estimated to be from 10 to 15 percent of the agricultural production potential, combined with the possibility of quickly converting storage stocks of feed into food, will tend to offset growing labor and machinery scarcity, but it will not be sufficient for any considerable period, in view of the expanded requirements of the "food for freedom" program.

Third, the assumptions of a freely competitive economy essential for prices to operate effectively are lacking, with the result that serious disparities within agriculture would develop, causing excessively high profits and incomes in some sections and low incomes and profits in others. The differences in production cycles for various farm products would be sufficient to create important disparities. Such disparities would not necessarily, in fact would not likely, be identical with relative demands for expanded or decreased output of farm products. Fourth, such disparities would contribute to weaken further the war effort because domestic purchases and expenditures of the relatively high income and high profits groups would

divert production from war output. A particularly well planned tax system stressing heavily the pay as you go aspects would be necessary to prevent these undesirable consequences.

Assuming that sole reliance for expansion of production cannot be placed upon favorable market price, what kind of a positive program should be developed that will accomplish the desired goals? Dr. Johnson suggests a "classified price" plan with individual farm allotments. There is much to be said for this specific proposal in spite of the probable impossibility of securing the necessary flexibility in rigid federal programs to get it to operate satisfactorily. The probable need as well as social desirability of paying more for additional or "war production" than for so-called normal production as reflected in the "base production allotment" as well as of paying proportionately less for surplus production, seems to be sound, and I shall attempt to add only one or two thoughts here that may illustrate more specifically the adaptations that should be made in carrying out such a program. First, I think all of us will agree that the base production allotments should be made for the individual farm so that it will correspond closely to its particular capabilities. Rigid formulas for crop acreage adjustment over large areas do not do this. Moreover such flat adjustment rates work poorest when increases in output are desired because of the great differences in unused potential capacity of various farms and farmers. Local committees should be given responsibility for establishing new bases in accordance with the land characteristics of individual farms and historical bases should be discontinued. In the establishment of such individual farm bases, agricultural experiment station and extension workers should play a very helpful role. But achievement of the necessary flexibility to secure such individual farm adaptations will be very difficult under federal programs and the lack of initiative evidenced in many local areas. However, proper coordination among local, county, state and federal workers could achieve this successfully with resulting increased benefits generally.

Another specific adaptation which might be made is use of such programs as the AAA to encourage selected farm practices as well as to achieve crop acreage adjustment. Is there any reason why payments should not be made for improved methods in livestock feeding and care if we need more pork and lard or beef etc., if we make payments for improved cropping or soil conserving practices to encourage conservation and output reduction? Some improved practices for which payments might be made include better feeding methods such as balancing of feed rations, premiums for feeding animals to heavier weights, premiums for quality which reduce wastes in processing etc., vaccination and related practices for disease control and reduction of disease losses both by death and slower gains, premiums for rapid gains, improvement of breeding stock and plant varieties, and similar practices.

As Dr. Johnson indicates, a difficult part of a program of this type would be to arrive at satisfactory rates of payments for "surplus" and "war" production and for selected practices. Obviously the rates are very important, else disruptive and undesirable results may be increased rather than re-

duced. However, if we have learned anything during these years of federal programs we should be in a position through thoughtful planning and intelligent action to accomplish needed changes more satisfactorily than those secured by dependence upon chance and the very imperfect and unsatisfactory play of usual price-making forces.

The second major point I wish to discuss, namely the difficulty if not practical impossibility of working out farm programs that will be most effective in winning the war, but which at the same time will leave the economy in the best position for post-war readjustment, must of necessity be done briefly. I think it a very worthy thought to insert in a paper, but frankly I believe that for the most part the goals of war agriculture and peace time agriculture are irreconcilable. There are a few instances such as increased output of dairy and poultry products, perhaps certain meats, reduction of barriers to interoccupational mobility, and interstate trade, in which the war effort will work harmoniously with what we should encourage during peace time. But there is nothing to be gained by refusing to admit that greatly expanded production of vegetable fibers such as hemp and jute and certain vegetable oils, as well as greatly increased pork and lard and many other products may not be economically desirable during peace time. Moreover, in many areas of this and other nations many industries are and will continue to be established which are wholly uneconomic to these areas. After the war is over, most of these will demand that they be kept going, will insist on the necessary subsidies, and many will undoubtedly receive it. This will mean further disintegration of world commerce.

Dr. Johnson's concluding paragraph points the direction which our post-war adjustments should take. We could have subsidized a staggering amount of consumption both foreign and domestic for the sum this war is going to cost us. As workers in land grant colleges and the government service, we have a double obligation: (1) to use all of our educational and research resources intelligently and courageously to help bring the war to a satisfactory conclusion, and (2) to keep our own thinking straight and attempt to get farmers thinking straight concerning the temporary and uncertain nature of much of the war production and the necessary fundamental adjustments on a world and not merely a nationalistic basis which must follow. We dare not repeat the mistakes of the twenties and thirties. Although winning the war may be of more immediate importance, the fundamental adjustments of the post-war period will in the long run be of even greater significance in establishing a satisfactory agriculture and an enduring economy.

DISCUSSION BY G. H. AULL

Clemson College

The assumption implied in a topic such as this is obvious: agricultural programs in effect when last we met were not designed to meet the needs of a situation which has since been forced upon us. It does not necessarily follow that the programs of 1933–1940 were inappropriate to the conditions of that period, nor that the machinery through which they operated is

inadequate to the needs of the moment. In fact, one might generate considerable enthusiasm in speaking of the benefits achieved as a result of the activities of many governmental agencies; enthusiasm which may even be increased when the full effect of the present emergency begins to make itself felt in this country. With respect to the manner and means by which these benefits were achieved and the equitableness with which they were distributed there may be somewhat less unanimity of opinion. However this may be, comparatively few persons will seriously question the ability of the United States Department of Agriculture to adapt its programs speedily and effectively to war needs nor challenge the capacity of its organization to bring about the necessary changes. The nature and extent of these changes and how they may finally be accomplished are matters not subject to categorical analysis and summary dismissal. However, certain conclusions are inescapable:

1. The war must be won for the allies.
2. In the meantime it is imperative that definite plans be made for a permanent peace based on a world economy.
3. Agriculture must play a major role in all of these developments.

The two great slogans which came out of the last international conflagration were: "The world must be made safe for democracy" and "Food will win the war." Food *did* win the war and food *might* have made the world safe for democracy, but the only nation in the world with both food and democracy chose rather to return to "normalcy" behind a false and thin veil of isolation. In the present emergency, to an extent even greater than the last, food will win the war and, *if we will*, food can write the peace.

Secretary Wickard[1] has very clearly outlined the essential needs in the way of foodstuffs and the reason why they are so important at this time. Summarized briefly, he explains that the principal needs are more dairy products, more pork, more eggs, and more fruits and vegetables:

(a) To feed our allies
(b) To meet increased demands in our own country
(c) To help get the world on its feet after the war

"Hitler will lose," he says, "but hunger will be stalking all Europe when he does" and "food, good food and plenty of it, is one of the best missionaries for democracy that I know."

Viewed in this light the challenge to agriculture is unmistakable. The question is how to meet it with the least possible disruption of the normal agricultural economy and in such a way as to minimize the ill effects of changes which may be necessary once the primary objectives have been accomplished.

Mr. Johnson not only has sketched the outlines of what is going to be required in terms of physical production but he has anticipated some of the problems to be encountered. His warning to the effect that "we need to fear more the possibility of agricultural production not increasing sufficiently to meet war needs than we do piling up unmanageable surpluses" is worthy of repetition.

[1] Claude R. Wickard, The South and food for freedom, address delivered at Memphis, Tenn., September 29, 1941.

The "program adaptation" proposed by Mr. Johnson consists largely in a combination of the "classified price" plan and a modified "base production allotment" which would include deficit as well as surplus crops. While there is undoubted merit in this proposal and some such scheme may finally have to be adopted it involves a staggering amount of detail and more responsibility than most men would be willing to assume. For many years agricultural economists have hoped for the day when a long time farm plan could be worked out for each farm on the basis of its current status and its relationship to future agricultural developments instead of its past (and perhaps unwise) performance. This, as Mr. Johnson says, is an "*ideal*." Insofar as any immediate program is concerned about the most which can be expected is a series of farm plans designed to accomplish the desired goals and flexible enough to be fitted into one or more of the recognized type of farming areas. Appropriate inducements could be offered in order to facilitate their adoption. This method, would be preferable to that now in use and could be put into practice somewhat more quickly than the one suggested by Mr. Johnson. While the details of such a plan would have to be worked out, essentially it involves an offer on the part of the government to buy certain specified quantities and qualities of farm products at stated prices from farmers or organized groups of farmers whose capital resources, organization and management practices conform or could be made to conform to recognized standards and who are both ready and willing to undertake their production. The prices offered could be varied to suit the requirements of the moment and might also be fixed with a view toward the long time adjustments so necessary to a permanent agriculture.

In recent years "better farm living" programs have occupied a substantial part of the time and energy of many agricultural workers even though they may not have been recognized as major activities by some of the principal agencies dealing with farm people. "Better farm living," while not the same as "subsistence farming," does imply a considerable degree of independence on the part of farmers designed to free them from the shackles imposed by forces from without and over which they apparently have been able to exercise little control. Subsistence living as such is poor living and has little to commend it, but it beats no living at all and, especially during times like these, *every one* should be encouraged to produce directly as much of his own food requirements as it is possible for him to do. Not only this but a great many families both on the farm and off, will perform a patriotic, if not a profitable service, by canning and preserving the surplus above home needs. For this purpose there will be available both private and community facilities. Agricultural programs might very well be adapted to the further development and encouragement of home farms and small scale industries, particularly processing plants as a war measure. This would serve both to increase the supplies available to the enemies of Nazism and to reduce the volume of goods necessary to be transported from one section of the country to another. In addition it may well mean an increase in the health and living standards of many who otherwise will receive little if any of the economic benefits resulting from activities connected with the war.

Another phase of the problem to which but little attention has been given is that of *waste*. It may well be that in normal times the country can afford to ignore this large item as is evidenced by the absence of any organized effort to control it; but these are not normal times and a small-size democracy could grow fat on the food which the people of the United States literally throw away. It is not too much to ask that, along with other things the American people be given a program designed to eliminate the extravagances which have always been unbecoming and which can no longer be tolerated.

Adaptation of agricultural programs to war needs should not be restricted to such things as have been specifically mentioned. For example, the requirements of war need not necessitate extensive increases in the fixed capital of agriculture but may involve some changes in lending policies with respect to certain types of financing. Lending agencies, both governmental and otherwise, should be aware of the dangers involved in the former and the opportunities for lasting benefits associated with the latter and should not only suit their programs to the needs of the hour but make them serve to facilitate desirable long time adjustments.

Finally while the situation is serious and its solution will require the wholehearted cooperation and undivided support of all agencies and individuals, there does not appear to be any real reason why the problem cannot be solved without sacrificing every worthy normal activity of public and private initiative. Naturally few interests of individuals will be remote from the all important task of winning this war and almost every phase of the national life will be altered until this is accomplished, but it would be a mistake to assume that only such things which *immediately* and *directly* contribute to this end are worthy of public support. This would be particularly true in the case of research and educational programs which in their nature are not generally to be found in the front line trenches but which inevitably play a strategic role in war and post-war planning. At the same time, the emergency should afford both an excuse and an opportunity to modify or eliminate any programs or activities—agricultural or otherwise—instituted for political rather than for economic reasons.

In closing I should like to add a word regarding the necessity for some further leadership, direction, and support in the matter of state and local programs affecting agriculture. My feeling is that a great many urgently needed adjustments are being retarded by legislation, or the lack of it, at a less-than-national level. This is particularly true in the fields of taxation, land policy and governmental organization.

DISCUSSION BY DON S. ANDERSON

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Professor Young's paper is, in the main, quite orthodox, even when he seems to attempt to evade the necessity of suggesting a solution to post-war problems by saying: "Perhaps this time we may learn how to stabilize the general price level, in which happy event many of the problems of post-war adjustment will shrink in importance."

About two-fifths of the way through his paper Professor Young gives the broad outlines of the principal part of his post-war program for agriculture. He says, "We would abandon, or place in a subsidiary position, the efforts to solve the problems of farming on the supply side. We would place the emphasis on distribution and demand."

This statement of his program is preceded by several pages of suppositions about what economic and social conditions may prevail when the war finally closes. What difference does it make? Can any conditions be imagined under which Professor Young's program is not a sound program for agriculture? Certainly Professor Young has not imagined them in all his conjectures as to what the post-war situation may be.

There is another disturbing thing about this speculation as to post-war conditions. It carries an implication that these conditions will be something imposed from outside—that we can have nothing to say about what they will be. Now, I cannot believe Professor Young thinks the conditions of the 1920's which led to the crash of 1929 were beyond the control of the people living in this nation. Tariff increases, loans to Europe, stock market speculation, installment buying, and corporations on the loose, were these inevitable, were they due to the fact that the control of the economy had passed into the hands of bureaucracies, or were they a part of that "free economy" in which the problems of economic reorganization for peace can be made expeditiously? Whatever they were could not other actions have been taken?

Having offered the outlines of his program for agriculture for the post-war period, Professor Young immediately announces that, "It is with reluctance that the writers have suggested this approach to the problem" and launches forthwith into an elaboration of three obstacles to the development of post-war programs based upon the principle he has stated. This apology and the lengthy discussion of why it will be difficult to secure the adoption of his program leaves time neither for telling why the adoption of his program would be advantageous nor what action would be necessary if we would abandon efforts to solve the problems of farming on the supply side and instead place emphasis on distribution and demand. It is not even suggested that all or certain parts of the Agricultural Adjustment Act should be repealed in our abandoning efforts on the supply side and it is left entirely to the imagination of the reader to find ways of placing emphasis on distribution and demand.

And all this "leads to the final conclusion that only through research and education can economists hope to affect the actions of the politician who will write the post-war programs for agriculture."

But what kind of research and what kind of education will be necessary to secure the adoption of post-war agricultural policies which conform to the principle Professor Young has outlined? Certainly, Professor Young has come to the conclusion that emphasis should be placed upon demand rather than upon supply only after appropriate research, for early in his paper he notes that it is distasteful for "one who has been trained to use the scientific method in his approach to economic problems" to even form hypotheses or flimsy premises. The research which led to the conclusion that

demand rather than supply should be emphasized must have yielded some arguments that could have been used to support this position, yet only apology is offered.

Certain evidence, that emphasis on demand rather than upon supply is the way to give farmers more income, comes quickly to mind. It is that most, if not all, of the increase in cash income from marketings which farmers have received during recent years (even if we include all years since 1933 as recent) has been the result of increased demand rather than decreased supply. At least, agriculture while breaking many production records, has been receiving larger income from the sale of its products. This suggests demand as the important factor in these larger returns from marketings.

The "critter" that was bred for scarcity turned out to be a means of producing abundance and now that we are supposed to "Remember Pearl Harbor" even those who planned the mating are rejoicing that what they planned did not come to pass.

This, of course, is not to deny that farmers' incomes have been increased by the Triple A benefit payments, but such payments can and have been made for producing as well as not for producing. In fact the largest payments have probably gone to those who produced most abundantly.

This recalls a place in Professor Young's paper where he speaks of "the widening gap between high and low income groups in labor and agriculture" and seems to suggest that this widening has been going on even during the decade of the "forgotten man." The evidence of AAA benefit payments appears to support this suggestion for of the $5\frac{1}{4}$ million payees reported to have received benefit payments, 37% of the payees received over 78% of the payments. The remaining 22% of the money went to the other 63% of the payees.

And what kind of education will our politicians require? Will it be enough to inculcate in them the principles of economics, to make them versatile in the theories of the economists, and in the history of what economists have talked and written about?

Who better than the economist, who has done the researching, should be able to write a program which would effectuate the principle Professor Young has stated in the proper basis for an agricultural program? But no action is proposed, there is nothing offered the politician that he can use as a basis for legislation or even for the repeal of legislation.

The reason for this is probably found in Professor's faith in what he calls a "free economy," but which he does not describe. Should he describe it, he would probably find much more planning in it than he seems to suspect—such as tariffs, taxes, patents, money and banking legislation, and corporation laws. Are not all these the results of planning? And can we have emphasis on demand with less planning than we did when we tried to put emphasis on supply? I believe in the principle Professor Young has announced. I only wish he had told how it could be used as a basis for action and that he had vigorously defended what he professes.

CANADA-UNITED STATES TRADE RELATIONSHIPS

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THERE are certain secular changes taking place in the whole pattern of world agriculture—changes taking place at a tempo and on a scale sufficient to mark the end of an era for some of the most characteristic forms of the world industry. There is now, in addition, the continually expanding impact of war, with its ancillary complications of new demands, new blockades, shipping shortages, new price ratios, and new measures of direct control and planned reorientation. Finally, there is in North America an embryonic but profoundly important stirring of a new conception of the relations of Canada and the United States which would have far reaching implications for the agriculture of each country. It is my task to discuss the prospects for Canadian agriculture and its relations to the agricultural industry of the United States in the post-war world, but it is obvious that this can only be done as part of a vast and constantly shifting pattern which today possesses more than the usual number of unpredictable and kaleidoscopic facets.

Basic Changes in the World Pattern

To a tremendously important degree the future of North American agriculture as an industry, as a means of livelihood, as a way of life, is coupled with the fortunes of the whole democratic world in the present life and death struggle. A German-dominated Europe, or an Axis-dominated Europe and Asia would dictate one set of conditions; a free Europe would make possible quite a different set. But regardless of the military and political outcome of that struggle there are some war-induced changes, and there are some war-accelerated changes, in the distribution, balance, governmental controls, and character of world agriculture in its relations to other industry which are likely to be of revolutionary importance. Very briefly, a few of the relevant high lights may be touched.

In either a Nazi Europe or a free Europe some shift in the balance and centre of surplus production from the Northwest to the Danube and possibly the Ukraine seems likely. Northwestern Europe, stripped not only of much of her livestock, but also of her overseas investments and other means of acquiring new herds and continuing feed imports, may have to face a substantial reduction

in the relatively luxurious meat and dairy product consumption standards of the past, while the resources of Southeastern Europe may be much more intensively and productively exploited. This shift may well be facilitated by the development of improved techniques in both production and adaptability of domestic agricultural products for direct consumption and industrial uses: we have but to think of the developments taking place today in another great specialized agricultural importing area—the ersatz rubber and silk industries of the United States—to realize how important this may be.

The war has finally brought home to the primary producing, raw material, staple exporting regions that the day of the expanding frontier for them is over. For years they have bucked the tide, submitting to increasingly unfavorable terms of trade and lower living standards while piling up unwanted surplusses of their special product—wheat, coffee, cotton. Their former channels of distribution had been shrinking, and this development, or at least its symptoms, had been fought, sporadically but bitterly, with complete disregard of economic laws. The war not only accelerated the market shrinkage, but vividly illustrated, in terms of floating steel walls and blockaded markets, and prowling raiders and lost tonnage, the desperately vulnerable position of the producers. This vulnerability extended to many essential supplies—the country which a year or two ago was high-pressured to buy a new railroad or some sewing machines is now on its hands and knees to get essential replacement parts. And finally, nearly every country is striving frantically to expand its war industries. It is a natural result, particularly in view of the constantly increasing adaptability of modern industrial techniques, that raw material, staple exporting region after region has turned to intensive hot-house programs of industrialization and diversification of its economy. But this must be balanced against the equally intensive development of certain branches of agriculture in both the continental enemy and the North American spheres.

Of much greater importance than the physical and industrial technological changes which have taken place and are taking place, partly under the pressure of war developments, is the tremendous growth of the administrative technique and practice of governments in dealing with activities related to agriculture. This growth

includes the development of machinery, bureaucratic vested interests, and experience, where none or very rudimentary forms previously existed, for rationing; price control; propaganda; control of all foreign transactions; control of all domestic investment, down to the establishemnt of priorities for binders, water pumps and incubators; selective taxation, and the ascertainment in detail of every man's, including even the farmer's, economic and fiscal habits and behaviour. The importance of these newly developed powers and techniques, when it comes to determining either the distribution of productive effort or of consumption in a nation is great if still largely unrealized.

Admittedly the outlook is grim for some of the specialized producing and exporting areas of the past. The post-world-war-I experience of the cane-sugar producing areas, for example, may be disastrously duplicated in a much broader field, embracing tropical plantation products, meats and dairy products from the Antipodes, meats and cereals and textile fibres from the Western Hemisphere; —in short, the very essence of world agriculture as we have known it. The farmer in these areas is no longer an individualistic entrepreneur operating, on the whole pretty freely, in a world system. He has been either amputated from or isolated from the violent fluctuations that characterized that system: it is a natural corollary that his national entity tends to accept more responsibility than hitherto for him, and guarantee him something approaching a proportionate share of the national income. The new productive and administrative techniques have greatly extended the area in which naticnal policies directed to this general objective are feasible. We have so far thought of the new techniques primarily as restrictive and protective devices; it challenges the imagination to speculate on what the same techniques, applied constructively and positively, could do to improve nutrition, expand consumption, and achieve a better balance in production from the viewpoint both of national welfare and producer's interest. Our frontier—our real and challenging frontier—is now the seamy side, rather than the fringe, of our economy. It is only to the extent to which we can develop this new frontier aggressively and effectively that we can hope to compensate for the loss of the advantages of international division and specialization of labour—a loss implicit in the acceptance of the new technique.

The Impact on Canada

Great as is the field for the constructive and intelligent use of the newly developed techniques we cannot rely on them alone to solve the problem of our primary staple exporting areas. I would like now to speak of the particular Canadian agricultural problem—it is primarily, of course, wheat—but in doing so, most of what I say can be applied, in greater or lesser degree to United States staples such as cotton, tobacco, citrous fruits, corn or pork, and wheat. For the first thirty years of the Twentieth Century wheat was the mainspring of the Canadian economy. The production and export of wheat took place on sufficiently favourable physical conditions and terms of trade to support a rapidly expanding agricultural industry, a huge transportation plant, numerous ancillary industries, and an extensive protected manufacturing industry. The sudden cessation of expansion in itself was a serious blow, for many of the related industries depended on a more or less geometrical progression of broken prairie, new railways, new elevators, new machinery agencies, new insurance agencies, new money lending institutions, and so on to new undertaking establishments. Contraction was of course worse. The history has yet to be written of a frontier economy that contracted painlessly and successfully. The essence and justification of a frontier economy is that, however wastefully and costly, it is expanding.

An even more serious fault has appeared in the whole structure, however. The Canadian economy had been built up, by and large, to export wheat and other primary products to Europe, and use the proceeds of these sales to pay for the essential coal, oil, iron and other industrial raw materials its protected industries required from the United States. This triangular process is possible only as long as the United States either buys from, or lends to, the rest of the world as much as the rest of the world buys from, or lends to, the United States. Reluctance of the United States to balance accounts in this manner will, of course, immediately affect such a dependent economy as Canada, and will be reflected in sharply reduced sales of United States manufactures, raw materials, such as cotton, and fruit and vegetables to Canada.

Of course, not only Canadian wheat but many United States staple exports depend on the possession by hungry prospective purchasers of United States dollars. If they lack that basic and virtuous attribute no conceivable corner of the wheat market, no

manipulation of cotton prices, can extract an extra nickel from them.

You may wonder why an alleged discussion of Canadian agricultural problems keeps harping on the United States balance of payments. It is simply because it is the most important factor in Canadian agricultural economics. In brief, if the United States is not prepared to buy from, or lend to, the rest of the world as much as the rest of the world buys from, or lends to it, Canada, because of her unique and peculiar economic position, cannot sell as much to the rest of the world, nor buy as much from the United States. The chief impact of reduced markets for Canadian exports will fall on Canadian agriculture;—and, incidentally a portion of the reduced Canadian demand for United States products will fall on United States fruits, vegetables, and other agricultural products.

Continental Integration

Let me suggest two possible lines of future policy—one, for those who may think I have overdrawn the picture, and who think that Canada will still be an important granary for Europe (ignoring, perhaps, whether Europe can pay for Canadian wheat and bacon and butter and cheese and apples and tobacco with coal, oil, iron, cotton, household and industrial machinery, tools, engineering and advertising skills from the United States, or can supply them as advantageously as from the United States). On the assumption that Canada will still find its major market in Europe, any development of closer commercial relations between Canada and the United States will be strictly a matter of horse-trading. There are mighty few Canadian farmers who will not trade a horse, if for no other reason than just to gyp a neighbor, and I have heard that there are traces of the custom in this country.

Well, there are lots of possible horse-trades—early American fruits and vegetables for late Canadian fruits and vegetables; American soya beans for Canadian oats and barley; American winter wheat for Canadian spring wheat, Canadian bacon for Middle Western pork and hams, Canadian feeder cattle as raw material for middle western finishers;—and a whole range of regional trades;—Eastern Canadian dairy produce for Wisconsin cheese; local border points' exchange of feed, livestock, dairy products, poultry; special seed supplies (such as potatoes and alfalfa from Canada); California, Texas and Florida citrous fruits for Canadian

berries; many local border points' exchange of fruits and vegetables; and so on.

These are suggested as horse deals which in every case offer an immediate *quid pro quo* to the producer group affected. It is admittedly useless, in the circumstances assumed, to tell the Western Ontario corn grower that American corn is now admitted duty free because the United States is importing Canadian aluminum and copper duty free, or to tell the Dakota wheat grower that Canadian wheat is now admitted duty free because Canada has abolished tariffs on steel and textile goods. Producer groups have made, and will continue making, tariff history in each of our countries; their hearts and minds are open to a direct cash appeal; they are not moved by academic considerations of the general welfare. But, as a matter of horse-trading, if the debits and credits are approximately balanced there is always a chance that the hapless consumer may swing the verdict.

Potential horse-trading in the North American sphere is important—but it only touches the fringe of the problem. It may be all we can do. Nevertheless, events of recent days have removed some of our political and national inhibitions. For many years the professional economist, on either side of the border, has paid lip-service to the desirability of continental integration. He has also excused himself from making any concrete proposal, on the ground that it was not politically expedient or realistic. Today, when we are locked in a common task, and forging a common objective, perhaps we may go farther.

In any scheme of continental integration some producer interests on each side of the border must be sacrificed. The inequity and impracticality of asking any group of producers to walk to the slaughter is obvious—producers don't do that, and they are quite legitimately entitled to fight for their existence, and they do. And our system has no convenient technique for liquidating them.

We know that in an expanding economy, adjustments are easier. This may sound platitudinous; trite. But everyone will agree that in a contracting economy—when men are losing jobs; when wages are being cut; when cattle, hog, and grain prices are falling; when "adjustments," as they are called—foreclosures; firings; what the accountants term "deferred depreciation"; overworked wives and children, weedy fields, scrawny stock, and starved fields; when

these adjustments are taking place—we are going backward. We would prefer an expanding economy.

An expanding economy does not occur by accident. Years ago it might: one never knew what fertile resources the Indians neglected. But today an expanding economy must be one deliberately designed to afford full employment, a sense of security, and a higher standard of living to the members of it. The mighty battalions of agriculture —the economic, social, and political primal forces of North American society—have lagged in their concept of a fuller life. Too often, even in a country such as Canada, vitally dependent on external markets, has the parochial and protective view triumphed at the expense of long run interests, and it is possible that this may have occurred in the United States.

But there is a grander conception of life—of both national and international society. Perhaps it must be built up bit by bit. It has been my purpose to argue that there is a basis for a high degree of complementary rationalization between the agricultural industries of the two countries; that the two have much in common in relation to the rest of the world; and that the agricultural fortunes of both Canada and the United States will be determined by the character of the internal and international policies followed by each country, and by the degree of collaboration received from other powers.

The agricultural situation on both sides of the border will be determined, more than anything else, by the general level of economic activity that will prevail in the post-war period. If Canada and the United States can achieve, as they ought to, a high level of national income and employment, and if they do their full part in collaborating with other nations to reach these ends on a world-wide scale, then our mutual agricultural problems will shrink to manageable proportions. The experience of the war has shown that when willing hands are given work and hungry mouths are fed, many of the immense surpluses that have plagued us for so long will largely disappear. Under such circumstances we could use not only our own domestic outputs but an increasing amount of the production of each other. The most effective way to ensure a rising volume of Canadian-American trade and achieve a more rational use of our resources is to see to it that widespread unemployment and hunger shall never again disgrace our society.

LATIN AMERICAN ASPECTS OF POST-WAR AGRICULTURAL READJUSTMENTS

FRANCIS A. LINVILLE
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CERTAIN views about the future are quite prevalent at present. In three ways it is expected that history will repeat itself. First, the present war will last little longer than the World War. Second, the outcome will be very much the same. It will be a hard fight but we will win it; and then Germany and Japan will be put in their places, Russia will go its own way and the remainder of Europe and eastern Asia will be opened to our trade again. Third, after the war is over the starving countries of Europe will buy great quantities of agricultural products from the American republics.

But in one respect it is believed that the future will differ greatly from the past. It is said that the people of the world have learned from their mistakes and that, led by Great Britain and the United States, they will tear down the worst of the troublesome barriers to international trade.

There are many reasons for holding these views and believing that agriculture will find it unnecessary to make some of the painful readjustments that have been called for in recent years. But if we are mistaken about a single one of the points mentioned, the future may be very different for the farmers of the American republics.

It is quite possible that this may be the case. Some wars have lasted more than four years. And it is far from certain that foreign trade will be freer than it was after the last war. Many of the same forces that led to a growth of protectionism after the World War are now at work; and governments, like our own, which wish to reopen the channels of world trade may find their task beset with serious difficulties.

Many people believe that there will be close cooperation between the democracies after the war and that, as a result, the United Kingdom, which was taking one-third of our agricultural exports before the war, will take further steps to facilitate imports of American agricultural products. But even if this is true, our exports to Britain may still decline. The United Kingdom normally paid for about one-half its imports with invisible exports, and the latter will be much reduced. Britain entered the war as a great creditor

nation and will end it as a heavy net debtor. Her merchant marine will probably be reduced in size. In addition, the loss of the lives of workers, deterioration of equipment of export industries, increased industrialization elsewhere and various economic dislocations will probably result in reduced exports. Most of these factors will also apply to the countries on the European Continent even if these countries make no effort to form themselves into a more self-sufficient economic unit.

True we fed part of Europe at our expense for a time after the World War, and we may do it again, but such generosity cannot be expected to last very long, especially if the present war proves to be as costly to us as now appears likely.

There is surely enough danger that restrictive commercial policies and lowered European purchasing power will reduce exports to the Eastern Hemisphere from the American republics to make worth while an examination of the position of the American farmer under such circumstances.

In addition to considering the position of the American farmer we should also consider the position of the Latin American farmer under the circumstances envisaged. We know now that the goodwill of the nations of this hemisphere is necessary for our military security if for nothing else, and our willingness to facilitate the sale of the goods Latin America wants to export is an essential element in obtaining that goodwill.

The chief agricultural exports of Latin America in 1938 were in order of their value, coffee, meats, sugar, wool, cotton, hides and skins, wheat, linseed and corn.

The general nature of our agricultural trade with Latin America can be sketched easily. Not more than one-fourth of our exports to Latin America have ordinarily consisted of farm products. We sold more of such goods to Japan in 1938 than to all twenty of the Latin American republics. But about nine-tenths of our imports from Latin America have normally consisted of agricultural goods. Half or more of these have been complementary and the remainder supplementary products. In 1936 coffee constituted two-thirds of the value of the complementary products, bananas 15 percent and cocoa 7.5 percent. Of the supplementary products sugar constituted 45 percent. Next, in order of their value, came vegetable seeds (chiefly flaxseed), cattle hides, wool, unmanufactured tobacco and meat and its products. Most of the supplementary products

come from the temperate parts of South America and from Cuba.

Let us examine the relative cost position of our farmers.[1]

Latin American producers could supply us with sugar at a price which few producers in continental United States can meet. Our present output is large only because of very generous government assistance to growers.

The competitive position of flaxseed has been similar to that of sugar, at least until the last two or three years. We usually imported more than we produced in spite of a 65 cent a bushel tariff. The cost of production in this country has now declined, but it is highly probable that imports will continue.

Since hides yield so small a part of the cost of raising cattle, it is extremely unlikely that increased imports of Latin American hides would cause much of a decline in our cattle production.

As long as the sanitary restriction prevents the importation of fresh, chilled and frozen beef from Argentina, our imports of such beef from Latin America are likely to be small. Our chief meat imports will continue to be of canned beef, but not even these are likely to be particularly large. In 1937 the quantity exported by Argentina, Uruguay and Brazil amounted to only about one twenty-third of the total production of beef and veal in the United States. Besides, a large part of this product is probably sold to consumers who would not buy fresh meat if they were unable to buy the canned product.

Cuba is a relatively low-cost producer of cigar leaf filler and scrap tobacco. A large reduction in our tariff or a decline in price outside of the United States would probably result in a considerable increase in our imports, but this development would be limited by the fact that Cuban tobacco differs in type from most of our domestic production.

The chief problem arising in connection with the products of which the United States and Latin America both have export surpluses is that of maintaining adequate markets outside the hemisphere. Of the major surpluses cotton is in the most unfavorable position. Foreign production has been increasing rapidly. Brazilian output, for example, has more than quadrupled since 1929–1930. Our production has continued far in excess of our normal consumption, and yet it appears that the world equilibrium price is much

[1] On this subject see Constant Southworth, Toward free trade with Latin America, Foreign Policy Reports, XVII, October 1, 1941.

below the cost of a large part of our producers. The cotton outlook will be far from bright if demand in Europe and Asia declines and if production continues to expand in low-cost areas of Latin America.

The outlook for our wheat farmers is more satisfactory because their cost position is less unfavorable and because our export surplus is far smaller.

Latin America would tend to sell somewhat more of her two chief complementary exports, coffee and bananas, in this country if the

ANNUAL NET EXPORTS OF LEADING FARM PRODUCTS OF THE AMERICAN REPUBLICS
(1935–1938 average)

	Quantity	*Net Exports as Percentages of U. S. Output*
Flaxseed (1000 bu.)	54,843	626
Cotton (1000 bales)	8,542[a]	63
Coffee (1,000,000 lbs.)	4,727[b]	—
Hides and Skins (1000 lbs.)	354,452	52
Wool (1000 lbs.)	223,904	52
Tobacco, leaf (1000 lbs.)	462,064	34
Sugar (short tons)	602,872	31
Beef and beef products (1000 lbs.)	1,231,284	16
Mutton and lamb (1000 lbs.)	121,736	14
Bananas (1000 bunches of 50 lbs.)	31,265[c]	—
Oranges (1000 boxes of 70 lbs.)	9,334	13
Corn[d] (1000 bu.)	264,648	12
Wheat[b] (1000 bu.)	87,752	12
Pears (1000 boxes of 50 lbs.)	3,329	12
Apples (1000 boxes of 48 lbs.)	9,595	6

[a] Export surplus plus average yearly increase in carry-over during this period.
[b] This surplus was equal to 65 percent of U. S. imports.
[c] 1936–1938. This surplus was equal to 17 percent of U. S. imports.
[d] Grain equivalent.

world price should fall; but the demand for them is relatively inelastic. A decline in the world demand schedules for these products would cause serious hardships for almost the entire populations of a number of countries.

The size of the changes in production or consumption which would be necessitated if the inhabitants of the American republics eliminated their export surpluses themselves is shown in the column of physical quantities in the accompanying table. Perhaps a better idea can be obtained of what this would mean from the column on the right showing the net exports (exports minus imports) of all the American republics as percentages of United States production of these commodities. If we were to include Canada's trade in this

table it would increase chiefly the value of the wheat surplus but would also make substantial increases in the surpluses of hog products, cattle, apples and leaf tobacco. On the other hand, it would reduce the sugar surplus by over four-fifths.

Occasionally we hear it suggested that the twenty-one American republics should export goods only to one another and that the United States should eliminate the hemisphere surpluses by reducing production or increasing consumption in order to insure the solidarity of the Pan American bloc. The lack of realism in such suggestions is apparent.

It would certainly be a major undertaking to reduce output by the amounts of the surpluses.[2] In the past year we have seen some tremendous changes in the production of many industrial products, and many more changes are in prospect. However, the cost has been extremely large, and some of the difficulties that would arise from such a contraction of *farm* production have never been faced. Undoubtedly the greatest problem would be that of restricting cotton output by 63 percent. We all know how difficult it has proved to secure any substantial reduction in output under the New Deal farm program. Cutting present production by almost two-thirds would reduce the number of cotton farmers needed by about one million and would displace great numbers of workers who are indirectly dependent on cotton for a livelihood. The incomes of millions of persons would be reduced in an area where incomes are already far below the national average. Great numbers of families would be forced to move to other regions since alternative lines of production would yield them so small a return in much of the South.[3]

No other commodity listed would create as great a problem as cotton, but the reductions indicated would be difficult enough to make, and making one would intensify the difficulty of making others because many farmers would find that they were estopped from turning to their ordinary alternative lines of production because contraction of output would be necessary in them too.

It is far from likely, therefore, that we shall endeavor to reduce our output enough to eliminate the Latin American surpluses if

[2] Reduced production in the United States could not, of course, eliminate surpluses which are in excess of our output.

[3] Labor displacement and alternative occupations, as well as many other points dealt with in this paper, are treated in greater detail in the author's An agricultural policy for hemisphere defense, JOUR. FARM ECON., XXIII, 726–742, November 1941.

markets in the rest of the world contract. We would have enough trouble solving the problem of our own surpluses. Professor Viner has remarked in connection with the possibility of foreign countries closing their markets to us that "we have already so fully exploited the possibility of doing damage to our economy by the erection of trade barriers that the remaining possible damage which could be inflicted upon us is probably not as great as that we have already inflicted upon ourselves."[4] Yet, as we all know, a large block of our farming population is still heavily dependent on foreign markets; a fact which leads inevitably to the necessity of continuing to reduce our excessive trade barriers as a means of persuading other countries to reduce their barriers against American farm exports.

As compared with the United States, it would be much more difficult for a number of the Latin American republics to reduce their output sufficiently if markets outside this hemisphere were greatly reduced. Their economies are much more dependent on agriculture and their agriculture much more dependent on non-hemisphere markets than are ours. For example, over half of Argentina's wheat exports, about four-tenths of Brazil's coffee exports and over nine-tenths of Argentina's and Uruguay's meat exports went to non-hemisphere markets in 1938.

The Latin American nations have had some experience with production and marketing restrictions—the results of which have sometimes not been very happy—but in the main their governmental machinery, their experience and their supply of government funds are less adequate for controlling farm production than are ours; and our own success in this field has been small enough.

It has been argued by some writers that if Latin American farmers find it impossible to sell their normal exports at attractive prices, they can shift to the production of hemisphere deficits such as rubber, silk, jute and tea. But before the war the Western Hemisphere's imports of agricultural deficits were only about one-third as valuable as its export surpluses. In the period from 1937 to 1939 two commodities, rubber and silk, constituted about two-thirds the value of these imports. Large quantities of rubber may eventually be grown in Latin America, but not before many years have elapsed, and silk cannot be produced there with present methods at

[4] International economic relations and the world order, The Foundations of a More Stable World Order (Lectures on the Harris Foundation, 1940, W. H. C. Laves, ed.), 55.

a price near that to which we are accustomed. The markets for both of these commodities are threatened by the production of synthetic substitutes. Moreover, the net import commodities are not suitable alternative crops for most of the producers of present export surpluses. The Brazilian coffee planter can shift to the production of cotton but not to rubber; the Argentine corn producer can shift to flaxseed but not to palm oil.[5]

In the long run the shift of farm workers to industry will help reduce the dependence of the Latin American countries on foreign markets for their agricultural products as has happened in the United States. Manufacturing of the factory type began to develop in the leading Latin American countries about 1885, and many of the prominent industries of today were founded between 1895 and 1910.[6] Dr. Bunge estimated that the value added by manufacture in Argentina in 1933 was almost half the value of all physical production there.[7] At present many of the countries produce all or a substantial part of their consumption of textiles and clothing, food products, beverages, furniture, pottery and glassware, pharmaceuticals, soaps and building materials. When F. W. Woolworth and Company began operating in Brazil it had to import 95 percent of the products it sold. It now imports only 5 percent.[8]

Almost all of the manufactured products which have been mentioned are consumers' goods. The production of heavy goods, which plays so important a role in industrialization, has been very slow in developing, largely because of the scarcity of skilled labor, iron and coal though the general cultural background has been partly responsible. Labor can be trained gradually and iron ore is available in some countries; but there is an almost complete lack of good coking coal.

I have dealt elsewhere at length with the possibility of the United States increasing its consumption of hemisphere export surpluses.[9] Here a few of the difficulties will merely be mentioned.

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[5] However, it is possible for some producers of bananas to start raising abaca—the two plants are of the same genus—and a few other possibilities of shifting could be found.

[6] This discussion of industrialization is based largely on George Wythe, The new industrialism in Latin America, Journal of Political Economy, XLV, 207–228, April 1937.

[7] Ibid., p. 214.

[8] S. G. Inman, The Brazil of Vargas, Nation, 323, Oct. 12, 1940.

[9] An agricultural policy for hemisphere defense, JOUR. FARM ECON., XXIII, 733–736, November 1941.

If people have more money to spend as they wish on consumers' goods, they will buy *less* of certain agricultural products, especially wheat. A very great increase in income would be necessary before many of the chief surpluses would be absorbed. Mr. H. R. Tolley has pointed out that if measures were taken to give everyone a Stiebeling-Ward "adequate diet at moderate cost"—the best that seems at all practicable—, we would consume one-third less of cereals, one-half less sugar and one-fourth less beef than at present.[10] The 4.7 billion pound coffee surplus has no place in the program of health improvement. We might adopt measures designed to increase only the consumption of surpluses, as the Department of Agriculture has done by means of the stamp, free school lunch and penny-milk programs; but these programs have not yet absorbed a large part of the surpluses; and their usefulness for this purpose is limited because many of our chief exports are not the products which our low-income groups need most.

What about the possibility of large increases in consumption in Latin America? Information about consumption in Latin America is limited, but certain fundamental facts bearing upon the subject are well known.

The population of Latin America is almost as large as that of the United States, and it has increased by about two and one-half times in the past forty years. A growing population means an increasing demand for farm products, but in countries where most of the young men are growing up on farms and where additional farm land is available, a growing population also means an increasing output of farm products.

Yet if the level of living of the Latin American population continues to rise, it may gradually help solve the problem of some of the major surpluses. Far more cotton can be used there to advantage. Although in the United States the per capita demand for wheat is declining and the elasticity of demand very low, in the tropics the demand situation is quite different.[11] A larger consumption of wheat would improve the diets of tens of millions of Indians, mestizos and negroes. Consumption has been increasing, but there are major deterents to this development. Many of the people prefer

[10] Mr. Tolley's statement is quoted in W. C. Waite and John D. Black, Nutrition and agricultural policy, Annals of the American Academy of Political and Social Science, CLXXXVIII, 224, November 1936.

[11] M. K. Bennett, Growth of wheat consumption in tropical countries, Wheat Studies, VI, 341–350, June 1930.

corn, mandioca, beans or rice; and, more important, they are unable to produce well the additional goods which must be sold in the world market if they are to import more wheat.

The Latin American governments will probably not bring about a large increase in the consumption of surpluses. They lack both the funds and adequate governmental machinery. In addition, with a few outstanding exceptions such as Mexico and Chile, laborers and other low-income groups exercise less control over their governments than do these groups in the United States, and as a result there is less pressure on the governments to spend heavily on programs to increase the consumption of low-income groups. Some improvement might result, however, if the many governments which are spending generously to prevent and cure disease came to understand more clearly the importance of malnutrition as a cause of ill health.

Industrial uses may create new demands for certain agricultural products, but such developments are difficult to predict. At present it would appear feasible for Argentina, which has to import large amounts of petroleum products, to convert part of her corn into alcohol for motor fuel. The government owns most of that country's great stock of corn, having taken it over at about 20 cents a bushel and having offered to resell part of it at 5 cents.[12] If conversion into alcohol should begin during this emergency period, it might be continued after the war. It is possible that a large part of the Argentine corn producers could afford to stay in business at the price which could be secured for corn used in this way.

Everywhere government measures to increase consumption are most likely to be directed toward the utilization of domestic commodities—pressure groups of producers will see to that. However, it might be possible for us to get the Latin American countries to use more of our surpluses if we agreed to adopt government measures which would lead to increased consumption of theirs. For example, our government might agree to buy bananas to serve in free school lunches if a few of the Latin American countries would agree to buy some of our surplus prunes and distribute them to their low-income groups.

But there are major obstacles to such cooperative arrangements. It would be difficult to discover many exchanges sufficiently attrac-

[12] G. L. Bush, Argentine corn—a story about a surplus, Agriculture in the Americas, 2–3, August 1941.

tive to induce the cooperating nations to undertake them. Probably more serious is the lack of the will, the government revenue, or the mechanism in most of the Latin American nations for such distribution of goods.

We have seen during the past few months how helpful a high rate of business activity in the United States can be in increasing the consumption of farm goods. If after this war we know enough about the functioning of our economic system to keep it operating near capacity, and if in spite of our great public debt we are willing to spend heavily on programs to increase the consumption of farm products, we shall not be plagued with unduly low prices for most of the agricultural products which we have normally exported, and we may even be able to assist the other American republics in disposing of some of their surpluses. But, at the very best the American nations are still going to be heavily dependent on Eastern Hemisphere markets for those great surpluses, cotton, wheat, coffee and probably sugar as well as for certain minor products.

If world markets are not restored after the war, the producers of these major surpluses will undoubtedly endeavor, probably with the cooperation of countries which are major consumers, to organize or perpetuate international marketing control agreements. In addition to such controls, production controls will also be needed. The countries of this hemisphere have had some unfortunate experiences as a result of raising farm prices without restricting output, but it is not certain they are even yet willing to apply the production controls that marketing restrictions imply. As all economic theorists realize there are real dangers in the operation of marketing and production controls, but since the slow and painful operation of "normal" economic forces injures a politically powerful group, the application of such controls is to be expected.

We can only conclude that the restoration and expansion of prewar markets is much to be desired. But powerful forces are at work tending to prevent this development, and only by keeping our goal clearly in mind and constantly striving to attain it can the people of this hemisphere prevent agriculture from suffering from extremely painful readjustments during the decade or so following the present war.

TRANSITIONS TO THE POST-WAR AGRICULTURAL ECONOMY

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THE SUBJECT originally proposed for this paper, Agriculture in the Post-Defense Economy, obviously will not serve the needs of this morning's program. Every speaker in the general programs coming before has concerned himself as much with the post-defense as with the war economy. Accordingly I have had to discard most of the pages which I brought with me and reorientate my ideas around some new focal points. The title now at the head of this paper describes what follows as nearly as anything I can suggest.

At least such a title has a merit of centering attention on the highly dynamic character of the economy in the years ahead, even including any post-war years within the reach of ordinary thinking. Any other type of analysis would therefore have been highly unreal.

I could, of course, have written a paper about some kind of an assumed post-war static state. At first I was strongly tempted to do this as a sort of escape from the horrors of the present situation. I could, for example, have taken the subject suggested as a reason for launching forth upon the outlining of a long-time program for American agriculture. This would have assumed that the war and post-war years are a temporary episode, which we will pass through in due time—and that the important thing is to have a clear idea of the direction in which we should be headed when "normalcy" is presently attained again. You will remember that many of us were talking that way back in 1921–23–24. Just a few years, we thought, and we will be back on an even keel and sailing steadily forward. But we were not half readjusted by 1929 when the new break came. And of course the break then was itself largely an aftermath of the World War. Some of you may have heard Dr. Hardy say on Saturday morning that the collapse in the 30's was more largely due to mistakes made in the 20's than to the war itself. But I doubt if most of those particular mistakes would have been made if the war had not come before.

If I had chosen to talk about a long-run program for American agriculture, then I suppose that I could have dealt with my subject

in a "rational" manner. This suggests the time when I was asked to discuss, before a business group, the subject of "A Rational Program for American Agriculture." What was expected was a program for an ideally functioning national economy—with each social group, each institution, each individual concerned, functioning in a thoroughly rational manner; and in the national interest also, because in such a rationale the national and individual interest become the same. The facts are, of course, that no institution, or agency, or group, and few individuals, behave altogether rationally. A *good* program—I won't call it rational—must be a *workable* one, must take institutions and groups as they are, and make the best out of them. The results are likely to be far from rational in the usual ideal sense of the term. The business group was of course disappointed in what I presented.

This point no doubt has a relation to the insistence of one of the papers the other day that what was needed was "education in the elementary principles of economics for the rank and file." I expect what the business group wanted me to do was to rake several of the agricultural programs fore and aft with broadsides of the law of supply and demand and other "sound" economic principles derived from a serene contemplation of atomistic economic forces operating in a vacuum. Approaching the subject in that way I surely would have needed to drive off the deck not only the several agricultural programs, but most of our time-honored agencies of government, including especially the Tariff Commission; not only our organized business groups and labor groups, but even corporate business in its modern manifestations.

What Social Strategy?

There also arises in this connection a fundamental question of social strategy—a question aptly illustrated by the three papers of Sunday evening on agricultural trade relationships. Professor Condliffe's paper set before our eyes an after-war picture of a division of labor in the production of food between Europe and the Western Hemisphere, in which division Europe would largely concentrate on bulky and perishable protective foods while the Western nations supplied the cereals and concentrates; a picture of populations in all these countries adequately fed and contented, with the war lords, the plutocracies and aristocracies shorn of their political power. Here we had an example of an idealized thoroughly

rational program. But Mr. Skelton, you well remember, could not help from thinking that the American cattlemen would not readily accept exports of American steel to Eastern Canada as a quid pro quo for imports of Canadian cattle; and that Canadian farmers would have some parallel difficulties. Mr. Linville discovered great obstacles of a related nature to South American-North American exchanges of goods. Programs to meet these difficulties are not rational in the ideal manner.

Now what is the best strategy? Is it to take the components of the Condliffe setup as immediate goals and drive for them with all our might in the years just ahead, and especially in the peace-making? Or is it to take account of the major near-imponderables and set our goals nearer within reach, and perhaps hope to move them forward later? Those who urge the first course are likely to be looked upon as dreamers and even mystics—at least while they are alive—and to be greeted with smiles, ranging all the way from those of pleased inner soulful satisfaction, such as one sees on the faces of kindly folks coming down the aisles after a well-administered Sunday morning sermon—there were many such in the audience the other evening; to, at the other extreme, the smile, almost of derision that played over the beaming face of Tariff Commissioner Edgar Brossard and some others. Those who avow the second course of action are always in danger of being called faint-hearted, or unimaginative, or without vision or power of leadership. "Sleep on, ye greasy citizens."

We Americans are all too poignantly aware of the way in which Woodrow Wilson's great hopes for mankind were thwarted by Great Britain and France at the last peace table, and then later repudiated at home. Is Great Britain ready to urge a different course this time? And her Empire states? It would be illuminating, if it were safe to do at this time, for us to have a word on this point from those who are working with the British day after day in Washington on the new wheat agreement.

Professor Condliffe obviously believes firmly that the outcome of this war is going to leave Europe so prostrate that Great Britain and the United States will be able to impose upon her the conditions for a peaceful society; or that the world will have been so completely war-disillusioned and in such desperate need that it will blissfully embrace a vision of the fulfillment of the revelation of peace.

This may well prove to be so. Indeed the length of the war is the major determinant of what the strategy should be. If the war ends relatively soon, on a basis of only partial capitulation of the enemy powers, we in this country surely will not be ready for anything approaching the new order described by Condliffe; and of course our adversaries will not be either. May I be pardoned for mentioning such a mundane thing as that the timing of the war-end in that case may fall in with our next presidential election in such a way as to give us a more or less reactionary government in this country—and a part return to the order of things here that Professor Young so artlessly, or artfully—I am not sure which—described as "the simpler economic life."

If, at the other extreme, the war stretches on and on until we in this country even are as exhausted as the people of Europe were in 1918–19, then we must be fearful indeed even of a dreadful social turmoil in our own midst that may rock the very foundations of our constitutional government. I am not sure we shall be able to hold on. If we go down, who then will establish the new world order?

The kind of a war end that offers best hope for the Condliffe fulfillment is one midway between the two extremes named—and at a time after the next election, with an administration in Washington that has an ideational complex much like that of the present one. I doubt if it makes much difference then whether it is Republican or Democratic—provided the complex is fundamentally right. I would have to say that there is enough of such ideation somewhere in the present Republican party to serve as a leaven for the rest of that party.

Domestic Goals

Suppose we do, for the purposes of this paper at the moment, accept the Condliffe formulation as furnishing the broad outlines of the post-war international economy—what would this mean for our domestic economy? I can abstract from Condliffe's paper most of the answers to the question. The rest are implied. First of all, the low-income groups will be having enough of the right foods in this country the same as in Europe. This consumption plus that of Europe will be absorbing the full output of our farms. The war will have drained away the surplus farm populations even largely from the congested areas; but we may have some deficits to take care of there. Of course we will have a well organized food distribution serv-

ice that will get the foods from the farms into the homes of the low-income families. Agricultural production will have been adjusted so that all the available labor and productive land will be employed in producing the kinds of foods that are needed to balance the human diet. Not only will there need to be no parity payments, there will be no payments needed to make up for the acres left out of wheat, corn, cotton and rice. These acres will be yielding an equivalent income or more from sales of other products they have substituted for these. These products will call for more extensive cultivation than the cotton and corn, and even wheat in most cases; but there will be fewer fanilies needing to make a living on poor land. The acres they have left will have been absorbed by their neighbors. The new cropping and land-use systems will be so ordered as largely to prevent water and wind erosion.

The millions of farm workers who were drawn off into defense industry during the war will have found substitute employment in peace-time industry, trade and services; except that some part of them will have returned to the land and relieved the heavy human labor burden of war-time and subsequent food production. No doubt there will have been a period of readjustment in between when public works, rural as well as urban, will have provided incomes for part of them.

As for industry, it will by then be kept pretty well employed turning out products of the sorts wanted by the now employed and buying public. Somehow or other a system of conduct of private industry will have been evolved under which prices in general are lowered fast enough with increasing output and declining costs so that the public can keep on buying. There will be maladjustments owing to miscalculations as to what the public wants. But the government will assist in righting these as they appear.

In the early years of transition from high tariff protection to a largely self-sustaining status, many industries as well as sizable groups of farmers, will have needed much government help. This, so far as possible, will have taken the form of finding alternative products and employment, and subsidizing these for a while by direct grants as infant enterprises.

There is no use in going further with details. All that was needed was that we get the outlines of the picture before us. Highly utopian, you will of course say. But it is also highly "rational."

We might dispute as to parts of the outline. Some of you would

prefer a somewhat different rationale. But there is no need for spending time on debating this. In general it matters little what the exact outlines are of any objectives such as the foregoing which society conceives. The objectives indicate merely the general direction in which it wishes to go. If any country were ever to attain its preconceived goals, the scene upon arrival would be so different from what had been envisioned at the start that few would be able to recognize it.

For this same reason I see little point in drawing any clear demarcation between war and post-war economy. Any realistic discussion of this post-war agriculture must pick up exactly at the point at which we will be when hostilities cease, and then proceed to go on from there step by step. What the broad steps will be will not be finally determinable even then. The planners of that coming day will do their best to analyze forces and foresee events; but the confused world in which they live will confound them. New events will constantly be breaking. Consequently the programs of steps then outlined will always be needing revision. In fact, each year, or each new turn of events, will be a new point from which to plan the steps forward.

Accordingly, you may properly ask: What can we do now away on this side of that day of cessation of hostilities that can have any guidance value when that eventful day comes? The answer is: not very much that is *final.* But we can consider all the different probable alternatives in the situation that may then arise; and think through all the steps that are best fitted to each, and even have our forces marshalled, and our agencies organized, so as to swing into effective action upon whatever course the particular event may indicate. The steps and their alternatives are already upon us. The transitions are already in progress. They will continue step by step and month by month, from this moment now, on until such time, if ever, as when we can lean back with a sweet sigh of reposefulness and say: I believe it will be safe for us to rest here a while.

The post-war will grow out of the war; and cannot be talked about intelligently except by beginning with the war. There will be no sharp break in these transitions exactly at the end of the war. The pattern of history set by the last war, and by most wars, includes a short, mild let-down, then very shortly a sharp upturn in business activity, based in part on the private spending of war-earned income on postponed consumption; in part on necessary

public spending on readjustments. The major break came in 1921 in this country, later in England and not until 1926 in France. It will be at some such point at the end of this war that the major unemployment problem will arise. If the war is long, this point may be considerably delayed. The Department of Commerce is now talking of a year of prosperity based on postponed consumption for each year the war lasts.

The Food Problem

I shall begin my analysis of transitions with food. This is necessary for logical reasons; but it prepares the way for M. L. Wilson's discussion of nutrition later in the day. So as not to duplicate his remarks in any way, I shall confine my remarks to food supply aspects as such.

On Saturday afternoon Dr. Johnson stirred some discussion by the following remarks: "We are not likely to make a great deal of progress in better diets for the people of this country during the emergency. The volume of food production will not be large enough to do that and at the same time provide the necessary military and lend-lease needs. . . . Bolstering the diets of low-income people is therefore likely to take up the slack after the war is over." If these statements are right, they are of immense significance. In the first place, they call for careful direction of any program of improving human feeding of civilians at this time. We cannot then go at this undertaking crudely by saying that every child needs so much milk per week, so many eggs, so much meat, and so forth. If so, we may precipitate the need for rationing of the very products we want used most widely. We must consider all different needs, weigh them against one another, and direct consumption along lines that will make our food producing and distributing resources go farthest in winning the war. Dr. Johnson spoke of military needs for food. I don't know whether or not he meant to include food for defense workers as a military need. He should have so included it. The stretching out of hours of labor in defense plants calls for careful additions to diets. The Europeans have had a successful experience with serving supplementary meals to workers on the job at critical fatigue periods. I have heard Dr. Canning surmise that the output per worker in British defense plants could be increased 15% by including more meat and dairy products in their diets.

These last few remarks may be invading Mr. Wilson's territory,

but I have found it necessary to say this much to point up my forthcoming emphasis on food production and conservation. We could precipitate a real conflict between the domestic food needs of the defense workers, the lend-lease needs I have just described, and a rapidly growing civilian appreciation of protective foods. The three must be coordinated with each other; but above all they must be coordinated with food production and distribution.

So far as food is concerned, we have suddenly shifted from abundance to genuine scarcity. (I am of course using these terms here in the market-wise sense as they relate to demand, supply and prices.) This war has added a large new demand element in the market. This scarcity is not yet felt fully in the market place. With the increasing tempo of the war, however, and the efforts to feed armed forces and essential war industry workers effectively, we shall see tight food situations developing one after the other. The lack of shipping space and the hazards of the shipping lanes are saving us at the moment. We should be building up stockpiles more rapidly than at present. Our war-time quota of foods is not only much larger; but its composition is different. Soldiers' and sailors' foods must be of sorts that can be stored and handled easily. The whole food supply of an expeditionary force must be of this nature. Civilian diets must be adjusted to this situation; and food production fitted to both.

We therefore have come upon a time of high-powered food "consumer sovereignty." We must begin with food needs and work back to food production.

The food conservation aspects are fully as important as the production. I was very grateful the other day when Mr. Shepard of the Agricultural Marketing Service called our attention to the great waste of valuable food elements—protein, calcium, etc.—that is going on under present utilization of skim milk. There may be a still larger waste in present methods of using wheat. The Canadians and Australians are insisting upon milling processes with around an 80% extraction—contrasted with our 70% or less—that preserve highly important minerals and vitamins that are only partly restored, and at considerable cost, in our enriched white flour; as well as much valuable protein. This Canadian flour makes a bread which is slightly grayish, very different from the whole wheat flour which is used to a limited extent in this country (only 3% of the total).

In order to get out the full volume of foods needing to be pro-

duced, we must conserve our primary food production resources of land and labor. All productive acres must be used somehow; all available farm labor. To illustrate by the case of agriculture in the Southern Appalachians: no more should we there see able-bodied men sitting day after day on rickety porches watching the procession of tourist cars go by.

There are two ways of getting food production out of stagnant men in congested areas. One is to move them where labor is more valuable than where they now are. This is the better way—except that housing may present a problem. This is a job for the public employment service and the Farm Security Administration. The other way is to bring more production opportunities to where they live. This may not be easy—the land may already be under acute population pressure. This is a task for the Extension Service, the Farm Security Administration and the Soil Conservation Service. No blanket prescription will do this job; it must be handled farm by farm and family by family.

This leads to some remarks about the participation of various federal agencies in the food production program. The Farm Security Administration workers in the counties need to continue their work with families now under loans and grants, and above all they must use their established associations with them as an aid in redirecting their production. The rest of their effort, and in many counties this should mean half or more of it, should be devoted to redirecting production in all the remaining low-income farms in their counties, making small war-food producing loans to them when needed without complete farm plans. The Soil Conservation Service work needs similarly to be redirected. Its workers should also concentrate on getting out the food production needed. But it should be a special concern of theirs to see that on all farms—not just those under agreement—the production plans do not waste soil resources. Only if aided in this way can the county agent's staff hope to handle the load imposed upon it.

With a revision of these programs along these lines, further budget cuts may well be forestalled.

How can we be sure that the production thus encouraged will fit into the consumption needs? I know of no more effective way than that outlined by Dr. Johnson. Such a program would almost in effect contract for in advance, at necessary marginal cost prices (plus, I hope, some further incentive payments at the start) the types and quantities of specific foods best produced in each area.

An individual farm plan as a basis for this would be desirable; but not fully necessary. The terms of the guaranteed prices, and conditions of production, could instead be announced by homogenous area units, as Dr. Aull suggested.

The instructions as to foods wanted—the advance orders, in effect—would come up from the branches of government needing the foods—from the procurement arms of the army and navy, from the lend-lease, defense worker, and civilian food-buying arms of the Surplus Marketing Administration. These demands would need to be coordinated, of course—much more than they are now. Once the foods were produced, their assembly, preservation, storing and distribution could be similarly directed and coordinated.

Started in this way, the output of the needed foods from the desired areas could be stepped up year by year with the growing war and civilian demand. What about the end of the war? As the food supply increased from year to year, the civilian and defense worker part of it would expand and presently reach all communities. Hence we would already have an organization in existence, equipped and experienced, prepared to step up civilian distribution. It would be equally ready to take over an enlarged post-war task of assembling food and getting it ready for a Europe at first starving, but later willing to rely upon Western sources of some foods if Professor Condliffe's fulfillment were realized.

Dr. Young spoke feelingly of the need for converting the federal agricultural programs over to a consumption and demand basis. Dr. Anderson seconded that appeal. It will be apparent that all that is needed to achieve this is to tie Dr. Johnson's proposal in with army and navy procurement, and with the lend-lease and civilian purchase programs of Surplus Marketing Administration, and to expand this latter.

Let us not, however, get ourselves confused by such terms as scarcity economics and abundance economics in this connection. Even while trying to build up production of foods that should be substituted for cotton in the South, and for wheat in the West, we will need to keep the acreage and output of these under rein. If not, at present prices they would absorb necessary acres and man labor needed for other products. We still need scarcity programs for cotton, for wheat in the main wheat-growing areas,[1] and perhaps even for corn, although I hardly think the latter. The change needed

[1] Permitting dairy and poultry farmers to grow wheat for dairy and poultry feeding on their farms might be desirable in some parts of the country.

is rather to rely on penalties for excess above quotas of these products; and to make up deficiencies of incomes by increasing the returns from other products. Dr. Johnson's proposal covers this amply.

When the war is over, and especially when the early period of feeding a starving Europe is over, we shall probably need scarcity controls applied to more products than the three mentioned. Hence we need to keep this phase of our adjustment programs in good working order even during the war. But its procedures need rapid revision in the direction to which they have been slowly tending—toward positive aiding of substitute types of production and land use.

As to whether we shall again need an overall program of reducing total agricultural output cannot now be foretold. I sincerely hope not. Much depends upon whether and how soon the long-range international and domestic goals spelled out by Professor Condliffe and myself are attained. So far as the domestic part of it is concerned, the faster we can develop a nation-wide Surplus Marketing Administration program competent to take over a full job of civilian food distribution, the better will be our chances of escape.

The Surplus Marketing Administration is at present suffering under a severe early handicap. In the past, it has been thought of as a relief agency—as an agency relieving surplus farmers on the one hand and relief workers on the other. It must now be conceived as the agency arranging for and directing the distribution of the additional foods needed in war time to raise the working efficiency of our total population; in post-war, to do the same for hungry Europe in addition; and in the longer-run to furnish the orientation for the balanced abundance program christened by Secretary Wallace.

Foreign Trade

In no sphere in economic and political life will the transition to the Condliffe economy carry us farther from our recent course than in the sphere of international trade in agricultural products. No doubt most of us unconsciously think of this transition in very simple terms—in terms of a complete razing of all tariff barriers at one fell swoop at the signing of the peace treaty, or at least some provision for a drastic lowering of these barriers step by step in rapid order. Yet we may doubt greatly if the transition would occur

in this way. All of us know about the coffee agreement already in force, of the wheat agreement now being evolved, and of cotton and several other commodity agreements under discussion. The agricultural world seems to be headed toward a growing network of such agreements. Some of the important figures in these developments take the position that individual commodity agreements will not serve, that groups of interrelated commodities need to be included in any agreement. This prospect becomes so involved as to make us ask ourselves whether or not some simpler procedure cannot be devised. Possibly the reciprocal trade agreement with its most-favored-nation clause offers a way out—some sort of a projection of this broadly into the whole international trade field.

In a period of peace and unusual freedom from disturbing episodes one can easily visualize a system of complete laissez-faire in international trade. In almost any country, however, a situation may arise in some industry or some line of agricultural production in which the maintenance of completely free international trade relationships make unusually painful the adjustments that will be needed. In domestic affairs we are probably past the stage when we will let the producers of a farm product in one section of the country bear unaided the brunt of readjustments called for by the development of superior advantages in new areas. We do not generally favor the setting up of tariff barriers to protect the apple growers in one orchard district from the competition of new and better varieties in another district. Nevertheless, we are likely in the future to lend what public aid we can to the disadvantaged areas to enable them to meet the new competition or to shift to a more promising line of production.

Parallel situations will always be arising in competition between producer groups in different nations. Shall these be dealt with by raising tariff barriers to protect the disadvantaged national group? Most of us would say that this is not the right way out. Yet I doubt if very many national governments even in a Condliffe type of economy will be able to resist fully the pressure to use some device that will attain the ends served by tariff duties.

In highly abnormal times such as the post-war period, we can be sure that the individual nations will find it extremely hard to throw wide open to the extremities of international competition the numerous producer groups that have suffered severe disruption during the war. What we are likely to have, therefore, is some kind

of controlled international trading under special agreements of one kind or another.

Prices

There will be time for only a few words on the important price aspects of the transition. (I am not at this point referring to the general price level phases of the problem, but rather to prices of farm products relative to other prices.) Much hard debate has been wasted in recent months over the issue of the level of prices for farm products. The prices of nearly all farm products are already at a level which is reasonably in line with the parity concept, and the problem is not to keep them up to this level but rather to keep them from exceeding it. The nation is going to be confronted with the situation of having the price of one product after another get too far out of line for the good of the national cause. Recent examples of it are the way in which prices of sugar and fats and oils soared at the outbreak of the war with Japan. Speculative rises of this sort help no one except those who happen to be carrying sizable stocks of those products. They embarrass the war effort tremendously. The Office of Price Administration will need all of the support which it can get in halting runaway markets.

I have spoken of the levels of prices reasonably in line with the parity concept. This statement needs explanation. Some prices are not now at parity as measured on the 1910–1914 base, but it will be found upon examination that this period establishes too high a base for these products. Wheat and corn answer this description. With some others, dairy products for example, the reverse is true. In the most recent agricultural legislation concerning price supporting measures, the level is described in terms of "parity or comparable prices."[2] The Department of Agriculture is instructed to work for a level meeting this test for the complete list of farm products. It therefore has become necessary to establish a complete structure of "comparable" prices. This raises the whole question of the proper basis for parity. It should be possible, at a time when the whole level of prices is high and with the urgencies of war upon us, to develop, introduce and establish a structure of relative prices for different products that puts all of them in reasonable line with each other and with the general concept of parity.

Some will think that this general level is too high; yet it seems

[2] July 1, 1941.

highly probable from what has already been said about the food situation that the simple forces of supply and demand will maintain such a level for all products except those that are still in surplus and need to be held under control, of which cotton is the arch example. None of us knows the shape of the demand curve for total farm products. We know that the demand curves for beef and mutton are something less than unity, and that for pork somewhere nearer unity, taking consumer groups as one general class. We know, however, that the demand curve for all meats combined is definitely steeper than unity. If we were to combine dairy products with meats, the curve would be still steeper. Accordingly, the logic and the data all point to a total demand curve for food which is highly inelastic. This means that any development that reduces the total supply by relatively small amounts, or increases the demand by relatively small amounts, will cause a sharp rise in price. We have been observing a manifestation of this in the last year. A recent Brookings Institution publication undertook to attribute the price rise almost entirely to parity loans. This was a factor in the situation but a relatively minor one.[3]

Dr. J. B. Canning has recently called attention to the shape of the income elasticity curve for many farm products, pointing out that a large difference in the per-capita quantities of meat and dairy products occurs as one shifts from income groups below $1000 to those in the next higher bracket. This carries the implication that the large increase of the earnings of workers in the developing war economy as men and women all find work at longer hours, and more continuously throughout the year, is going to precipitate a sharp demand for many food products. Some exception has been taken to this form of statement by those who are strongly obsessed with ideas about the fixity of food habits. We can be sure that a mere increase in income of these low-income groups will not be followed immediately by an increased demand for many items in the food list. Probably the demand for fluid milk will be somewhat slow to respond. On the other hand, an enlarged consumption of butter will develop rather quickly and that of meats still more so. There are very few low-income families that would not at once begin including more meat in their diets if they had the income.

[3] The attempts of certain workers in the Department of Agriculture to derive unit-elasticity curves out of historical price and supply series for total farm products are completely unconvincing.

The import of this is that we are going to need price control to keep the levels of prices of different products in reasonable line with each other. Meat prices in particular are likely to soar if there is no control.

Some of you may of course argue that they should be allowed to do this as a way of inducing a more rapid increase in production. However, an $8–$10 price for beef will induce expansion of production almost as rapidly as twice this price. The short-run cost curves for products having a long production period are extremely steep in the higher reaches.

As suggested earlier, just at the end of the war there will be a brief let-down in the economy if history repeats itself. At this time it may be necessary to introduce some price supports for farm products. This support may need to be continued for products on the list that are not wanted in Europe. If the Surplus Marketing Administration is properly developed during the war years, it should be able to deal with this situation effectively. There will also be some let-down in employment in this brief interim.

Is the concept of party tenable in the longer post-war run? And should the surplus marketing machinery be used to maintain such a general level over all the post-war years? The answer must be a conditional one. If the nation has been able to establish a peace-time division of labor along the lines that Professor Condliffe has suggested, and if our domestic economy has attained the blissful state of relatively full and stable employment, the parity level will sustain itself without any general support other than an appreciable amount of subsidization of the consumption of protective foods by a considerable fraction of families in this country that do not have enough income to provide these foods even when employed. Even with an ideal dispensation the poor will always be with us; yet as a nation we are very highly concerned with the children of the poor—with their food and health even more than their education.

There will be changes in technique that will lower the costs of producing some foods. Any reasonable parity concept must provide for changes in these costs. Changes in internal and international competition will also enter into the problem and call for adjustments in production. Hence the parity structure of prices must be looked upon as a flexible structure moving through time.

Of course it is always possible that the reservation prices of farm people generally, or of particular groups, may prove to be so low, or

that opportunities for alternative employment in industry prove so discouraging, that the general level of parity prices will prove to be too high. The writer makes no case for the years 1910–1914 as establishing the proper general relative level as between farm incomes and industrial workers' incomes. Nevertheless, some relative level can be established which will reasonably well fit the prevailing reservation prices at any time.

Farm Labor

Wages of farm labor may not rise during the war to any higher levels than net farm incomes. If they should rise higher, this might be looked upon as an offset for their failure to share proportionately in the agricultural gains since 1933. They are not likely to remain at such levels long. Acute *local* labor shortages are what is most to be feared. A vigorously functioning farm placement service is therefore highly necessary. The Federal Security Agency has recently begun bestirring itself to handle effectively this phase of the problem. Local labor market information as to occupational needs and labor supply must be assembled in advance of the needs. The labor force must be made more mobile, especially that part of it which is in the congested areas.

The level of farm labor wages that is attained in war time needs to be sustained at that level afterwards, relative both to net farm incomes on the one hand and to urban wages on the other. Urban unemployment at any time will be the strongest influence toward breaking down this level.

Urban Employment

This leads to a consideration of the most vital phase of post-war planning—anticipating the plant closure and reduced operation of many thousands of enterprises that will have been turning out war-needed supplies and equipment. Providing in advance for the transitions in such employment to be made is the major task of planning for the post-war. The shift to employment that will turn out the desired goods of the postponed-consumption type will be important; but relatively easy to plan and provide for. The more difficult part of it will relate to the enduring type of consumption and production. This must be known in advance of the depression that will presently develop if not forestalled; and programs must

be ready for forceful expanding of this the moment that any shadow of a recession begins to darken the horizon.

At the best, something of a break will appear that will need to be met with public works in order to keep up employment. The ideal types of public works are those that represent self-liquidating investment—like housing. Durable consumers goods to be sold on short-term repayment plans are self-liquidating more quickly than housing. The Farm Security Administration has established a pattern for these. Woodland and other improvements can be made directly self-liquidating in part. The other returns to the public from them come in the form of an enlarged tax-base. Investments liquidating only in the indirect sense—like public roads and public health facilities—may, however, be more significant than some of the directly liquidating types. Professor Alvin Hansen discusses the problem of public works spending in his new book on Business cycles and fiscal policy.[4]

Probably in these years we shall find ourselves supporting a much larger peace-time army and navy than ever before. That will be our contribution to the international police force. The rest of us will need to work harder than before to maintain this army; but if it assures peace, we shall not complain.

Price Levels

It should not be necessary here to repeat the familiar statements as to the dire effects upon agriculture of vigorous war inflation followed by drastic post-war deflation when the break finally comes. It will be better if I confine my remarks to the current and developing price level situation. Last spring at several meetings in which I participated in the Midwest, I said that this nation need not go again through the same experience as last time; that students of monetary science and fiscal policy knew enough about ways and means of preventing inflation so that the job could be done if the President and Congress really wanted it. It is now apparent that both the President and Congress wanted prices to rise—the President probably only moderately and by degrees—"5% at a time," as someone expressed it. There has been no runaway yet. There may be if the Administration and Congress move too slowly in the next six months as war output grows.

Direct price control has been more effective than commonly sup-

[4] Norton Company, New York, 1941.

posed. The 20% of the items in the Bureau of Labor Statistics wholesale list that have been most directly under federal control —metal goods mostly—have risen relatively little as an average. The legislation now in the mill will considerably strengthen the arms of Office of Price Administration. But we have had to wait too long for the legislation.

Furthermore, these direct methods needed to have been reenforced almost from the start by some rationing of production and sales of non-essential commodities, and they will need this increasingly from now on. Merely shutting off the purchasing of any list of commodities, however, will not be effective as long as a growing volume of buying power is allowed to run loose in the economy. If the larger incomes cannot be used to buy automobiles and refrigerators, then they will help to bid up the prices of other commodities as they become scarce. The time is now already far past when an effective combination of taxation that reaches down to the enlarged weekly earnings of fully employed workers, and to the increased net incomes of farmers and shopkeepers, plus a more or less enforced system of savings, needed to have been imposed on the economy if price levels were to have been kept from rising too rapidly. Any legislation or administrative procedures of this sort now in prospect are likely to leave an "inflation gap" which by next July will be at the rate of something like ten billion dollars a year. With the war activities still expanding, there will always be a lag in the process of siphoning off the increased earnings into financial support for the war program. Therefore, unless some radical change in the thinking of those responsible for directing public policy and in the attitude of Congress, develops in the very near future we may see price levels at twice their present position within two years.

The so-called secondary inflation that began to appear within six months after the end of the last war has commonly been attributed to the "Victory Loan." Fiscal analysts are now disposed to say that most of it would have occurred anyway. We are likely to be faced with a similar bulge at the end of this war. It also can be prevented if public programs are properly planned and directed.

Probably one of the reasons that pressure to prevent inflation has not been as strong as would have been wise is that too many of the persons in the center of the thinking on this problem in the Administration hold to the belief that whatever price level is attained can be sustained thereafter. They seem to think that it is

relatively easy to hold prices up by some program of vigorous public spending aided if necessary by monetary manipulation. They admit that the price level fell badly after 1937, but say that the Administration did not use the vigorous measures needed at that time if the price level was to be sustained, and that it will be willing to use them to head off a major break sometime after the war. Not being thoroughly indoctrinated along these lines, the writer expects that an important slump will develop in spite of any efforts of those in power likely to be permitted; but he has some faith that the decline can be held within bounds.

* * * * *

Few of us really believe that the ideal rational dispensation outlined by Professor Condliffe and myself, and a similar program for maintaining price levels, will be fully realized in the first decade of peace. Nevertheless, we should direct our daily lives as professional economists with the strong intent of bringing to pass a condition of affairs as near to these goals as is possible in a political and economic system of the sort that we are likely to have during and after the war. Probably it will be best for us to assume goals and objectives as idealized as those outlined and to push as hard as we can toward them, knowing very well, however, that we will fall far short of attaining them.

We should not leave to government agencies the full task of leadership. As individuals and as members of university faculties and professional organizations, we should exercise to the limit all of the positive constructive force that is in us. This is not the time for "sniping." Neither is there any place in the picture for those who inevitably arrive at the conclusion, often consciously but more often unexpressed, that "it can't be done."

DISCUSSION BY J. F. BOOTH

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Several speakers at these meetings, including Dr. Black, have referred to the effect of price trends on the war and post-war situation but it seems to me that not enough has been said on this point. I would like to enlarge somewhat on this angle of the situation and, in doing so, to refer to Canadian experiences during the past two years.

At the outbreak of war in September 1939, Canada appointed a body known as the Wartime Prices and Trade Board. The Board was endowed with powers to prevent "undue enhancement in the prices of food, fuel and other necessaries of life and to ensure an adequate supply and equitable

distribution of such commodities." It was given authority to investigate, to license, to buy, to sell or take possession, to control imports or exports of any necessary of life, to recommend changes in customs duties, and to fix maximum prices for mark-ups. In dealing with rents and with certain commodities, i.e., wool, sugar, coal, hides and leather, and animal and vegetable oils, the Board appointed Administrators to whom important powers were delegated.

The Board working with other governmental agencies including the Agricultural Supplies Board, and in cooperation with producers, manufacturers and the trade generally, centered its control around the organization of supply and regarded price fixing as a last resort. It endeavored, through consultation with interested parties, through investigation, education and other means, to prevent rapid increases in prices. Its efforts were centered on individual commodities in the price structure rather than on the general price level. Its authority to fix prices was used only in four instances. Its efforts, in the main, were restraining rather than prohibitive—a point that will be referred to again.

The Wartime Prices and Trade Board, though regarded as the principal agency dealing with prices, has not dealt with all products. The price of wheat, for instance, is pretty well determined at present by the minimum prices established by the Canadian Government through the Wheat Board. Prices of certain other products have been determined by export contracts with the British Ministry of Food. The Bacon Board, the Dairy Products Board and the Special Products Board administer these contracts. The prices of some agricultural products have also been controlled by Provincial Boards or Commissions which carry over from peace times.

Other products are under the jurisdiction of the Department of Munitions and Supply. Lumber, steel products and some non-ferrous metals are products subjected to regulation by controllers appointed by this Department.

An effort has been made through the Department of Labor, in cooperation with employers and other labor groups, to prevent undue increases in wage rates. A plan for stabilization of wages in war industries was adopted late in 1940.

In addition to the measure described, government fiscal policies have been designed, as far as possible, to prevent inflation. The aim has been to obtain for war financing, a large part of the new income created by the war effort, realizing that this would also have the effect both of stabilizing prices and of restricting demand for non-essential products. To that end, taxes and non-tax revenues have been increased threefold since 1939. Approximately fifty cents out of every dollar earned by Canadians in the year ending March 31, 1942, will go to the Federal, Provincial and local governments for war and ordinary financing.

It is important to note that while Canada undertook, in this rather comprehensive program, to apply certain restraints on prices and on wages, the general policy was to prevent "undue enhancement"—not to freeze the economic system at the level prevailing in September 1939.

For a considerable period—some twenty months—the plan was effective.

Business expansion was rapid, the national income mounted, wholesale prices, including those of farm products, increased appreciably but the cost of living rose by only eight per cent.

Then the situation changed. Despite heavy taxation, the demand for a decreasing volume of consumer goods caused living costs to rise more rapidly. In a few months the increase was quite appreciable and there were many indications that the country was about to experience a repetition of the inflationary spiral that commenced at about the same period in the progress of the first World War.

Believing that such a result was both undesirable and unnecessary, consideration was given to the formulation of a new and far reaching plan for the control of prices. This plan, announced late in October, provided for the fixing of price ceilings on all commodities except fruits and vegetables and on a wide range of services. The maximum price or rate that may be charged is not to exceed the highest price or rate charged during the period September 15 to October 11. The plan became effective December 1. At the same time provision was made for the extension of the Government's wartime wage policy to cover all industry. This policy provides, among other things, that no employer in Canadian industry or commerce may, without permission, increase his basic wage rate. Farmers and the operators of other businesses employing but a limited number of men, are exempt from the provision of these regulations.

It is not my purpose to argue the merits or demerits of such a program, though I think a case can be made for a comprehensive plan of control. We in Canada have had to choose between inflation (perhaps I should say "*more* inflation") and control, and you in the United States are now face to face with the same problem. Our decision which has already been made and yours, whatever it may be, will affect the agriculture in our respective countries; and since we as agriculture economists are expected to have some views on the matter perhaps I may be permitted to discuss this aspect of the question.

My interpretation of the effects of inflation in past wars leads to the conclusion that the result has not been beneficial to agriculture. I have had occasion to review these results recently, and while I know that most of you are familiar with what occurred, perhaps it may be of interest to look at the record again in the light of present developments. The prices used apply to the United States but they are also representative of what took place in Canada.[1]

Most farmers probably hold the opinion that wartime inflation is a good thing for agriculture. They would agree, however, that they base their judgment mainly on what happened during the three years 1917 to 1919 inclusive. Actually the record of previous wars is not favorable; nor is that of the last war if post-war effects are taken into consideration.

Going back to the War of 1812–14, it will be found if the years 1807–11 are used as a base, that in the 20 years from the commencement of that War

[1] The indices used in this comparison are those appearing in The Demand and Price Situation, published by the Bureau of Agricultural Economics, Washington, October 1941, and are based upon the series compiled by Warren and Pearson.

to 1831, prices of farm products were below the prices of non-farm products in 14 years. Prices of non-farm products increased more rapidly than those of farm products throughout the War. From 1815 to 1819 the situation was reversed and farmers enjoyed an advantage; but in the next twelve years only one was favorable to agriculture.

In the 20 years from the outbreak of the Civil War to 1880, only three were favorable to agriculture if comparative prices mean anything. And again these favorable prices did not come during the years of warfare. They came in the years 1868, 1869 and 1877. These were the only years between 1861 and 1880 that price relationships favored farmers. The base period used in this comparison was 1856–60 inclusive.

The record since the commencement of the last war is about as bad as that of other wars. In the 25 years, from 1914 to 1938, only eight were favorable to agriculture when comparisons were made on the 1910–14 base. In this instance, after a slow start, farm product prices ran ahead of the prices of non-farm products in the years 1917, 1918 and 1919, but they lagged behind in 1920 and in all but four years since that time.

It is significant, too, that despite the general improvement in the relationship of the prices of farm products to those of other products throughout the last 150 years, the margins between such prices became wider in succeeding post-war periods. In the years following 1812–14, after the major decline had taken place, the margin between farm products and other products was never greater than 10 points. In the period after the Civil War the difference was as much as 23 points. Since 1920 the margin has several times exceeded 30 points.

It would, of course, be a mistake to suggest that all the disadvantages experienced by agriculture in the years following these periods of price inflation is attributable to this one cause. But who, viewing the record impartially, would contend that it was not a major factor?

Farmers have a greater interest in price stability today than in any previous war period. They are more dependent, both in the marketing of their products and in the purchase of farm requirements, on urban labor and industry than ever before. With marketing costs—mainly wages—declining but little during periods of inflation the major portion of the decrease is borne by the producer. What amounts to a 10 percent decline in retail prices may be a 20 percent drop in wholesale prices and a 30 or 40 percent reduction in the price actually received by the farmer. The prices of the product he buys, on the other hand, are influenced not only by this same cost structure but in some instances by imperfect competition as well.

There is a good deal to be said for a moderate increase in prices—for a little inflation—sufficient to restore a balance in price relationships. It may be argued, too, that rising food prices tend to divert production to the war effort by reducing the income available for the purchase of non-essentials. However, other means of achieving this result are worthy of consideration. A case might also be made for a degree of inflation to facilitate the reduction of debts. But, inflation on the scale experienced during previous wars —and likely to be experienced again unless counter measures are taken— is another matter.

Price increases such as those discussed have not characterized all wars but they appear to have been associated with most major conflicts and with the greatly increased cost of modern warfare the basis for inflation is correspondingly increased. After two years of war, or of defense preparation, the stage is about set for a rapid price spiral. If it develops it might easily become the greatest inflation in history—and its after-effects on agriculture, the most disastrous.

It will be said that we must have increased production—that winning the war is our most important problem just now—and this is true. But if price control can be made effective and the prices of farm products bear a fair relationship to costs, there is reason to believe that the necessary production will be forthcoming.

It may be urged that it is over expanded production that makes necessary subsequent readjustments and if increased production be attained even without inflation, we shall still experience serious post-war problems. In part this is true, but it is hoped that the new interest in nutrition may be the means of utilizing some of the surpluses we envisage when the war is over. And in any case, the more serious problem is that associated with a greatly inflated prive level—high wages, taxes and other costs that are slow to adjust, and levels of living that are difficult to maintain on normal incomes.

I should like to add at this point that in my opinion the unfavorable relationship of the prices of farm products to the general price level in recent years should be considered in applying any control measures. Price regulation should not be permitted to perpetuate gross inequalities. However, the situation has improved very materially during the past year and the prices of many farm products are now on a fair exchange basis. Those that are not might well be dealt with on a special basis—one that would not interfere seriously with the application of a comprehensive program of price regulation.

Finally, both Canada and the United States will, in all probability, experience serious problems in the field of agriculture when this war is over. Control of prices will not prevent the emergence of certain difficulties. It may be necessary to devise schemes that will enable both agriculture and industry to readjust to a peacetime basis; to develop or extend programs of conservation and more intelligent land use; to assist with a program of public works adapted to agriculture's needs; and to recognize and correct nutritional deficiencies by encouraging increased consumption of certain products. But the problems that agriculture will face in the post-war period and the extent of the undertaking necessary to deal with them will depend to a very large degree upon the amount of price inflation that occurs in the meantime.

PRIVATE ENTERPRISE AND CONSERVATION*

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I. The Meaning of Conservation

THE CONCEPT "conservation" is used rather loosely in the social sciences. Commonly, the popular meaning is carried over into scientific usage without disentangling its many connotations. The first step in our analysis, therefore, must be a precise formulation of the meaning of conservation in economics.

The term "conservation" was deliberately adopted in 1907 as a name for a movement in the United States, the driving forces of which need not be discussed here.[1] The name was chosen to capture the imagination of a nation which was to be awakened to the problems of its resources. Previously, the term was used mainly in the spiritual meaning, with positive or negative moral connotation, of keeping institutions, prerogatives, ideals, and the like "unimpaired" in the "status quo," on the "present level." In relation to resources, terms like "preservation," "protection," "restoration," and "wise use" appear in the literature on conservation during the last quarter of the nineteenth and the beginning of the present century. However, the term "conservation" was and is used not only for "flow"[2] resources which may be kept on the present level of productivity in spite of use, but also for "stock"[3] resources which are

* Paper No. 102 The Giannini Foundation of Agricultural Economics.

[1] Cf. Gifford Pinchot, How conservation began in the United States. Agricultural History, 2(4): 255–265.

[2] Resources are defined as flow resources if different units of a resource become available at different instants of time. The rate of flow may increase or decrease with time without human action. No rate of flow diminishes a future rate of flow and it is possible to keep up use permanently provided the flow is permanent. Two distinct subclasses of flow resources may be distinguished according to whether the flow can or cannot be affected by human action. The term "human action" is employed instead of "use" because rates of flow may be increased through conservation action, as explained below. Decreases in rates of flow caused by human action are the effects of use in the widest sense, that is, effects of carelessness and outright destruction are included.

[3] Resources are defined as stock resources if the total quantity of the resource available either does not vary significantly or decreases with time. Each rate of use diminishes some future rate of use. To keep use up permanently is impossible although use may be kept up for "very many" instants of time—depending on the definition of an instant (cf. footnote 4). We differentiate between two subclasses of stock resources, namely, between those the quantity and quality of which do not vary at all with time and those which deteriorate over time. The latter subclass may again be subdivided on the basis of whether natural deterioration can or cannot be influenced by human action.

necessarily depleted through use. To cite only a few examples, people commonly speak of the conservation of oil, natural gas, ores, and already-produced strategic metals. For this reason alone, it is inadequate to define conservation as the maintenance of the status quo. Furthermore, such a definition is misleading also for flow resources. Maintenance of the present level of productivity is only a special case in the conservation of flow resources. Actions aimed at slowing down a decrease in the rate of flow or at increasing rates of flow are doubtless conservation although they have no relation to the present rate of use. Likewise, conservation does not necessarily mean maintenance of any constant rate of flow or use, whether that constant rate be the present rate or any other. Constancy of rates of flow and of use is a special case in resource utilization. Confinement to such a case through definition of conservation oversimplifies the economic problems involved and makes a practically useful theory of conservation impossible.

What then is the general meaning of conservation regardless of the type of resource considered? Conservation clearly involves a decision of the planning agent with respect to the distribution of rates of use over instants[4] of time. By instant we mean the "planning interval," that is, that period of time during which changes in rate of use are not considered. We may define then as the general meaning of conservation all actions resulting in a redistribution of rates of use over time in the direction of the future. As a corollary, we may define as depletion all actions resulting in a redistribution of rates of use over time in the direction of the present.

By "in the direction of the future" is meant an increase in future rates without any decreases or such a distribution of increases and decreases that the increases are further removed than the decreases. By "in the direction of the present" is meant a decrease in future rates of use without any increases or such a distribution of increases and decreases that the decreases are further removed in the future than the increases. This differentiation on the basis of time sequence of changes in rates of use is generally sufficient because usually all the increases are followed by all the decreases or vice versa. If a more frequent alternation of positive and negative changes is planned, the sum of increases and decreases before the midpoint of the planning period may be compared with the sum of increases

[4] The actual extent of an instant in terms of "clock" time may be any period—a day or a part thereof, a week, a month, a year, a certain number of years (for instance, a crop rotation)—depending on the nature of the problem to be solved.

and decreases after the midpoint, having due regard for the sign of changes and with or without using as weights the distances from the instant in which planning takes place. The same or some other scheme of weighting must also be adopted if it is desired to measure conservation or depletion.

It is apparent that the definition of conservation and depletion does not refer to a certain state in the distribution of rates of use over time, but to the direction of change. A certain state in the time distribution of rates of use will be called the "state of conservation" which is synonymous with the "state of depletion." Conservation and depletion may be undertaken at any state of conservation except at the two limits.[5]

The concepts of conservation and depletion have no relation to the sum of rates of use in all instants, that is, the ultimate cumulative use.[6] Conservation and depletion may increase or decrease cumulative use or leave it unchanged. This is in conformity with common usage. Ultimate cumulative use of stock resources with natural[7] deterioration is often (for instance, in the case of natural gas and oil) greatest if the stock could be used up entirely in the first instant of time. The term "conservation" would hardly be applied to such change in utilization plans. On the other hand, economizing in the use of strategic materials and their storage for emergencies would generally be called a conservation measure although the stored materials may deteriorate.

It scarcely needs to be mentioned that conservation and depletion as defined have no moral or ethical connotation. Moral and ethical standards affect, of course, the wants and the "real" costs of individuals and social groups and influence strongly the social institutions under which economic decisions are made.[8]

[5] The limit for conservation or the "maximum state of conservation" is the maximum rate of use in the last instant of the planning period without regard for previous instants. Similarly, the limit of depletion or the "maximum state of depletion" is the maximum rate of use in the first instant without regard for following instants. These two maxima must be sharply differentiated from the "optimum state of conservation" discussed below.

[6] Cumulative use is simply the integral of rates of use over time. Conversely, rate of use is the first derivative of cumulative use with respect to time. If $X(t)$ stands for cumulative use, the rate of use is $x=dX/dt$.

[7] "Natural" means not brought about by human action (cf. footnote 2).

[8] This connection between ethics and economic concepts such as "conservation," "depletion," "time preference," etc., was made perfectly clear in the author's previous writings: Land conservation and social planning. Plan Age, 5(4): 109–119, section 2; and, Economic aspects of land conservation. JOUR. FARM ECON., 20(2): 462–473. The attack on this point by A. C. Bunce in: Time preference and conservation (JOUR. FARM ECON., 22(3): 536) is directed against straw men of his own creation. Use of this time-worn technique in polemics is a matter of taste.

Conservation and depletion are concepts of economic dynamics in the sense that they imply shifts of revenue and cost schedules expected by the planning agent in different instants of time. Such changes in the time pattern of revenue and cost functions would occur even if human wants and the "state of the arts" were regarded as constant. Changes of revenue and cost functions over time occur, first, because of cumulative use, and, second, because flow as well as stock resources change in quantity and quality over time without use. Cumulative use may cause shifts in revenue schedules because the accumulation of durable products and of scrap affects demand; accumulation of cut diamonds and of metal scrap influence the demand for uncut diamonds and for ores. Cumulative use may cause shifts in cost schedules because it becomes necessary to drive mine shafts deeper, to follow thinner veins, to utilize ores of lower metal content, to drill oil and water wells deeper and to pump from greater depth. Changes in quantity and quality of a resource over time regardless of use may affect revenue and cost functions in many ways. The growth of timber affects both revenue and cost functions. The "blowing off" of natural gas affects cost functions of both gas and oil. Changes over time in the total quantity of fish and other wild life resources available may affect decisively cost functions.

It follows from the effect of cumulative use upon revenue and cost functions that conservation can be obtained through decrease in rates of use as well as through increase of positive efforts. Positive efforts may be directed at reducing deterioration of stock resources, at increasing the flow in case of flow resources, and at recovering stock and flow resources after they have been used. Depletion can be obtained *mutatis mutandis* in the same way. Practically, the two ways of accomplishing conservation and depletion are closely intertwined. Theoretically, they represent different combinations of productive services to produce a desired time pattern of rates of use.

Conservation and depletion should not be confused with investment and disinvestment.[9] Conservation and depletion refer to *physical* changes in the time distribution of rates of use of individual resources. Investment and disinvestment refer to *value* changes of capital of persons or groups as a result of differences between income and consumption (in value terms) in the same instant (Keynes) or

[9] This is done for example by A. C. Bunce, op. cit., p. 536.

in the previous instant (Robertson).[10] Investment and disinvestment have no necessary relation to rates of use of individual resources. It often happens that investment results in depletion and disinvestment in conservation.

II. Conservation in Relation to the Problem of Maximizing Net Revenues Over Time

After defining the concept "conservation" we may ask how decisions about the distribution of rates of use over time are reached. Little needs to be said about the goal of this decision. It is assumed here that the goal is that distribution of rates of use over time which maximizes the present value of expected net revenues. This assumption is sufficiently realistic if the interpretation of net revenues, revenues, and costs, which, of course, must be measurable in comparable units, is adapted to the planning agent considered. The resulting distribution of rates of use will be called "optimum state of conservation." We shall consider, first, how the optimum state of conservation is determined under a given set of conditions and, second, how changes in these conditions change the optimum state of conservation, that is, result in conservation or depletion.

Determination of the optimum distribution of rates of use over time differs from the determination of an instantaneous optimum rate. The same net revenues occurring in different instants of time have usually a different desirability.[11] To make them comparable they must be computed for the same instant through discounting.[12] However, maximum present net revenues are not simply the sum of discounted maximum net revenues of individual instants. It was just mentioned how rates of use and expenditures for conservation in one instant affect revenues, costs, and rates of use in later instants. Furthermore, services of many durable productive factors are not bought for each instant, as assumed in "instantaneous" (better

[10] Although the term is used ambiguously by many authors, all agree that value changes of total capital and not physical changes in the use of individual resources are under consideration. Space does not permit discussing this point fully. Abundant references are found in G. von Haberler, Prosperity and depression; a theoretical analysis of cyclical movements, pp. 170–254. Geneva, 1939.

[11] Desirability is used here synonymously with utility. Net revenues may be desirable for the entrepreneur because they have utility to others at the same time or in the future. Utility and desirability include intangible items such as "power," "social prestige," etc. Cf. A. C. Pigou, The economics of welfare, chap. 2. London, 1932.

[12] Rates of time discount may change over the period of maximization, and may be positive or negative. What determines the rate of time discount used in private enterprise and how it is related to the interest rate will be discussed below.

"simultaneous") production theory, but such factors themselves are bought with a view to using them over many future instants; the costs and rates of use of one instant are then related to the costs and rates of use of other instants. Finally, there is the possibility of producing a resource for storage; in this case revenues and rates of use in different instants are interrelated. Net revenues, revenues, and costs are therefore nonadditive functions of *all* rates of use occurring during the period over which utilization is planned.

Time permits sketching only in bare outline the theoretical solutions of the optimum distribution of rates of use over time. The details, for instance, complementarity and competitiveness between different resources and the adaptation of theory to practical use in actual planning must be left to a more comprehensive study which is in preparation.

One way to determine the optimum state of conservation is offered by the theory of joint production. Rates of use in different instants can be regarded as joint products. The maximization of net revenues considering more than one instant can thus be treated analogously to the instantaneous maximization of net revenues considering more than one product. Rates of use in different instants may be classified as complementary, competitive, and independent in revenues and costs through use of the same criteria as rates of different products in instantaneous production. The economics of joint production was recently discussed elsewhere and little needs to be added here.[13]

Of the three theoretical approaches to the maximization problem in joint production, namely, the marginal cost, the marginal productivity, and the indifference approaches, only the first two have practical importance in time problems because usually more than two instants have to be considered simultaneously. The hypersurfaces necessary in this case in the indifference approach are too cumbersome to handle. If the marginal cost approach is used, partial derivatives are obtained from present (in the sense that all elements are properly discounted) total revenue and cost functions with respect to rates of use in different instants, and the routine steps of the theory of maxima and minima are applied.[14] If the

[13] Cf. S. v. Ciriacy-Wantrup, Economics of joint costs in agriculture, JOUR. FARM ECON., 23(4): 771–818. Application of the theory of joint production to time problems is also used by J. R. Hicks, Value and capital, Oxford, 1939; and Sune Carlson, A study on the pure theory of production, London, 1939.

[14] If V stands for present net revenues, R for present revenues, Q for present costs,

marginal productivity approach is used, the optimum state of conservation is obtained by comparing the marginal costs of a unit of individual productive service with the marginal value product of such a service. Individual services are differentiated from each other not only on the basis of their technical qualities but also on the basis of their dating.[15] If the supply of productive services is perfectly elastic, we have as a condition for the optimum state of conservation that productive services will be employed until the marginal value product of a unit of each service is equal to the price of that unit.[16] Prices of products and services are compared for the same date.

The fact that rates of use with different dating are treated like rates of use of different resources under joint utilization implies a fixed number of instants. An entirely new production plan has to be devised if an additional instant is considered. Salvage value is regarded as a part of revenues of the last instant. Depreciation influences the time distribution of rates of use through current revenues and costs. We are not concerned here with depreciation methods but with the task of making the present value of the difference between "income" and "outgo" (in Irving Fisher's sense) a maximum.

In many practical cases of resource planning the assumption of a fixed number of instants is justified. It is often possible also to

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and $x_0, x_1, x_2, x_3, \cdots, x_n$ for rates of use in instants $t_0, t_1, t_2, t_3, \cdots, t_n$, we have: $V = R(x_0, x_1, x_2, x_3, \cdots, x_n) - Q(x_0, x_1, x_2, x_3, \cdots, x_n)$. Differentiating we obtain as condition (subject to the usual tests) for the optimum state of conservation:

$$\begin{aligned}
\frac{\partial}{\partial x_0} R(x_0, x_1, x_2, x_3, \cdots, x_n) &= \frac{\partial}{\partial x_0} Q(x_0, x_1, x_2, x_3, \cdots, x_n) \\
\frac{\partial}{\partial x_1} R(x_0, x_1, x_2, x_3, \cdots, x_n) &= \frac{\partial}{\partial x_1} Q(x_0, x_1, x_2, x_3, \cdots, x_n) \\
\vdots \qquad\qquad \vdots & \qquad\qquad \vdots \qquad\qquad \vdots \\
\frac{\partial}{\partial x_n} R(x_0, x_1, x_2, x_3, \cdots, x_n) &= \frac{\partial}{\partial x_n} Q(x_0, x_1, x_2, x_3, \cdots, x_n)
\end{aligned}$$

The meaning and the cost function and its relation to the production function were discussed elsewhere. Cf. S. v. Ciriacy-Wantrup, op. cit., pp. 778–779.

[15] If A, B, and C are productive factors and $a_0, a_1, a_2, a_3, \cdots, a_n$; $b_0, b_1, b_2, b_3, \cdots, b_n$; $c_0, c_1, c_2, c_3, \cdots, c_n$ their services in instants $t_0, t_1, t_2, t_3, \cdots, t_n$ a production function appropriate to the present problem may be written $F(x_0, x_1, x_2, x_3, \cdots, x_n, a_0, a_1, a_2, a_3, \cdots, a_n, b_0, b_1, b_2, b_3, \cdots, b_n, c_0, c_1, c_2, c_3, \cdots, c_n) = 0$. Variables expressing rates of use of other resources produced jointly may, of course, be included in the production function as well as in the revenue and cost functions.

[16] Proof and implications of this condition do not need to be repeated here (cf. Erich Schneider, Theorie der produktion, pp. 42 and 76–79, Wien, 1934; S. v. Ciriacy-Wantrup, op. cit., p. 789).

confine the study to a small number of instants because the system studied may be regarded as passing into a stationary state or because an instant may be defined in such a way that the number of instants to be considered becomes small. In such cases the joint production approach is not too cumbersome. However, this solution of the maximization problem becomes inadequate if the period of time over which maximization is to take place is regarded as variable and if the number of instants is large. Conditions under which the length of the period of maximization is fixed, or a stationary state expected, or the number of instants small, are merely special cases of the general case in which determination of the optimum length of the period of maximization over any number of instants constitutes an integral part of determining the optimum state of conservation.

If the problem is looked upon in this way it is convenient to formulate present net revenues as an integral over a variable period of time.[17] The elementary approach through differentiating with respect to rate of use and period of maximization ($dV/dx = dV/dT = 0$) cannot be applied because, as emphasized above, revenue and cost functions change over time. This makes it necessary to determine optimum rates of use as a function of time. One approach is through the use of a Lagrange multiplier.[18] Another approach follows from the fact that present net revenues, present revenues, and

[17] $$V = \int_{t=0}^{T} [R(x, t) - Q(x, t)]e^{-it}dt$$

V is the present net revenue; T is the length of the (variable) period of maximization; R and Q are the revenue and cost functions; i is the rate of time discount expressed in per cent; x is the rate of use; t is the time variable indicating different instants. As above, costs do not include interest or depreciation. Interest is taken into account through discounting the net revenues of each instant. In integration, of course, continuously compounded interest is dealt with. Depreciatoin is an a priori indeterminate. It appears after the period of maximization and the time distribution of rates of use have been determined. Depreciation accounting is merely a technical necessity of bookkeeping required by the difference between accounting period and maximization period. Salvage value may again be regarded as part of output at $t = T$.

[18] The routine steps are lucidly explained by Hotelling and do not need to be repeated here. Harold Hotelling, The economics of exhaustible resources. Jour. Pol. Econ. 39(2): 137–175. We refer to the steps in maximizing the integral

$$\int_0^{\infty} qp(q)e^{-\gamma t}dt$$

on pp. 146–148. Hotelling's q corresponds to our x and Hotelling's p is the net price per unit of product received. The optimum extent of the period of maximization is determined by that instant t at which the function $x_{(t)}$ which maximizes present net revenues becomes zero.

present costs are functionals. They are not simply functions of the rate of use as in instantaneous situations, but one value of the integral of net revenues, revenues, and costs is associated with the rate of use as it changes as function of time.[19] In order to find that function $x_{(t)}$ which will maximize our net revenue integral, that section of the theory of functionals which is known as the calculus of variations is applied.[20]

This sketch of the determination of the optimum state of conservation may be used to clarify concepts like threshold of conservation, costs of depletion, and costs of conservation. Conservation will become economical as soon as costs of depletion occur. The latter can only be interpreted as decreases in present net revenues through deviations in the direction of the present from the optimum time distribution of rates of use.[21] Costs of conservation may be interpreted as the effects upon present net revenues of a maldistribution of rates of use in the direction of the future. However, this may easily lead to confusion with the costs of conserving services of productive factors used for conservation.[22] It was emphasized

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[19] If a variable changes with the shape of a variable function we speak of a functional. A functional should not be confused with a function of a function. One value of revenues, costs, and net revenues is associated with each whole function $x_{(t)}$.

[20] Since the method of the calculus of variations is explained in every good text on advanced calculus it is sufficient here to mention the possibility of this theoretical solution of the maximization problem. Euler's equation is simplified because only the two variables time and rate of use appear in our integral. It may, of course, be desired to introduce cumulative use or other variables in addition to time or to replace time.

[21] Costs of depletion in this sense are a function of rates of use in the joint production approach and a functional of rates of use in the calculus of variations approach. This is criticized by L. C. Gray and Mark Regan in their article: Needed points of development and reorientation in land economic theory (JOUR. FARM ECON., 22(1): 34–46). They state that the " 'threshold of profitability' [of conservation] has no necessary reference to the destruction for which the marginal physical unit of present utilization is responsible" (p. 43). We did not refer to "*present* utilization" and defined marginal costs of depletion and not "threshold of profitability" by "the decrease of the present net value of the expected future product caused by the destructive effects upon the land of the production of the marginal physical output" (Land conservation and social planning. Plan Age, 5(4): 110). Gray and Regan fail to see that present net value as function of a time pattern of physical outputs is under consideration. In their own definition of the threshold of profitability of conservation "when the present value of the marginal unit of impairment, either of the future product or of the use-bearer itself, just equals the cost of prevention or restoration" (p. 43), they mention a derivative without stating what function is meant and with respect to what variable the derivative is taken.

[22] Most factors may be used for conservation and depletion. Labor may be used for planting green manure crops or for planting soil-depleting crops. Plows can be used for building terraces and for exposing steep slopes to water erosion or arid grazing lands to wind erosion. Even fertilizers and manure may bring about depletion under certain conditions.

above that the optimum state of conservation cannot be determined with reference to groups of services but only with reference to all services.

III. Factors Affecting Conservation

1. *Changes of revenue and cost functions under certainty of expectations and constancy of time discount rates*

Thus far we have tried to show how given expectations of revenues, costs, and time discount rates will result in a certain state of conservation. We may inquire now how changes in expectations result in changes of the state of conservation, that is, bring about conservation or depletion. Such an analysis is a crucial part of conservation economics because it allows forecasting the effect of changes in expectations and explains conservation and depletion in its historical perspectives; it is the basis for devising public conservation policies and for judging how social institutions, often incidentally and unnoticed, bring about conservation or depletion.

We may start with the simplifying assumption that changes of expectations are equally certain and that the time discount rate remains constant. These assumptions will be discarded later.

It follows from the joint-product character of rates of use in different instants that changes of expectations with respect to revenue or cost functions in one instant or in a whole series of instants do not only affect rates of use in these instants, but also the revenue and cost functions and thereby the rates of use in instants for which no change in expectations has occurred. Theoretically all instants over which the utilization plan extends are affected. For example, an increase in rates of use may be planned for a number of future instants because an upward shift of revenue schedules brought about by price increases is expected for these instants. In stock as well as in flow resources this may mean conservation or depletion, depending on how rates of use in preceding and following instants are influenced by the new utilization plan. In other words, it is always necessary to determine how far rates of use in different instants are complementary, competitive, or independent in revenues and costs. This is true even if, on the basis of a current price increase, greater and greater upward shifts of revenue schedules are expected, that is, if the elasticity of expectations[23] is greater than

[23] For a definition of the elasticity of expectation, cf. J. R. Hicks, Value and capital, p. 205. Oxford, 1939.

unity. The same applies *mutatis mutandis* to changes in cost functions.

One practically important special case may be mentioned in which such an investigation of complementarity, competitiveness, and independence of rates of use is not necessary.

This is the case of a stationary state[24] in resource utilization. If changes in the time distribution of rates of use are *a priori* conceived as changes from one stationary state to another, upward shifts of revenue and downward shifts of cost schedules must by definition result in conservation and opposite shifts in depletion. The weakness of this assumption is the disregard of the usual oscillations before a new stationary state is reached and lack of any theoretical foundation for the expectation of a stationary state. As a practical approximation this assumption may be used under special conditions. In planning land utilization in agriculture and forestry a stationary state is usually implied. Land valuation, for instance, is based on such an implication which, however, is often not justified.[25]

2. Changes in uncertainty and the importance of individual foresight

We may now abandon the assumption that all expectations of future revenue and cost functions are equally certain. Expectations become gradually more uncertain, the more the instants considered are removed in the future. It is important, therefore, to know how differences of uncertainty[26] between instants are taken into account in the utilization plan and how changes in uncertainty result in conservation or depletion.

One approach to the first problem is used by Hicks and others.[27] The judgment by the individual of uncertainty, and his willingness

[24] In the sense that rates of use are either constant or that changes in rates of use are strictly periodic.

[25] It will be remembered that conservation as defined above must be clearly differentiated from preservation of the present level of soil productivity in agriculture and from "sustained yield" in forestry.

[26] Uncertainty is not fully taken into account by defining revenues and costs as the most probable expectations. Often mathematical expectation values cannot be determined. However, even mathematically identical expectation values may require different economic treatment if the dispersion pattern is different. No differentiation is made here between uncertainty and risk. F. H. Knight's differentiation based on different categories of probability is not followed because "hunches" and "intuition" as well as inferences from a priori premises or statistical investigations find expression in revenue and cost expectations. For some purposes it may, of course, be useful to differentiate uncertainty and risk on the basis of measurability of probability.

[27] Cf. J. R. Hicks, op. cit. pp. 124–126.

to disregard uncertainty find expression in an allowance for uncertainty in his expectations of revenue and cost functions. This allowance appears as a deduction from revenues and an addition to costs. The allowance will generally vary with time and may be expressed as a rate.

However, this is not the only and not the most realistic possibility for the planning agent to take uncertainty into account. He knows that uncertainty concerning a future instant will decrease as time goes on because more and better information becomes available, the more this instant is approached. He will attempt, therefore, to postpone as far as possible those decisions the execution of which would make an alteration of the utilization plan costly when fuller information becomes available.[28] Such a more flexible plan may yield smaller present net revenues than a fixed optimum plan for certain expectations, provided that these expectations come true; but a more flexible plan may yield greater present net revenues if expectations do not come true. Flexibility of plans, therefore, involves additional costs or loss of revenues or both if expectations become true. If these costs are high and if the dispersion of possible values around the most probable expected values is small, and regular, flexibility will not be carried far—and vice versa. Increases in flexibility of plans and increases in the allowance for uncertainty may be regarded as economic alternatives.

We can now answer our question how changes in uncertainty affect conservation and depletion, other things being equal. A decrease of uncertainty will bring about conservation and an increase depletion. A decrease (increase) of the allowance for uncertainty may be looked upon as upward (downward) shifts of expected net revenue schedules (total, average, and marginal) in all instants to an extent which is proportional to the remoteness of each instant in the future and equiproportional for all points of each schedule. It becomes economical, therefore, to increase (decrease) rates of use the more, the further instants are removed in the future. By definition this means conservation (depletion). A similar conclusion must be reached as to the effect of a decrease in flexibility. Flexibility of utilization plans is accomplished by substituting factors with less durability for factors with greater durability, or less specialized

[28] Cf. A. G. Hart, Anticipations, uncertainty, and dynamic planning. Studies in business administration 11(1). The Journal of Business of the University of Chicago 13(4) 98 p.

durable factors for more specialized durable factors, or both.[29] This will increase costs (in the sense of shifts of cost schedules) and thereby decrease rates of use the more, the further rates of use are removed in the future. This means depletion. A decrease in flexibility brings about the opposite result.

It is of great interest to know whether individual judgments about the uncertainty prevailing in different instants, and the reaction of individual entrepreneurs to these judgments influence the production plan directly or whether these subjective factors are "coordinated" through a market, and are effective only indirectly through market prices. How far individual foresight[30] influences the utilization plan, is of particular interest for public conservation policies.

In a perfect market for future trading of products and services, expected marginal revenue and cost curves are horizontal and identical for all individuals. This follows from the definition of a perfect market as a market in which all individuals can purchase and sell any desired quantities at the prevailing price. Actually existing futures markets do not extend sufficiently far into the future to be of any help in the economics of conservation.[31] It can be shown that there is little possibility that this will ever change. Producers of resources have to make expenditures long before the resulting revenues occur. They are anxious, therefore, to "hedge." Most potential buyers have no such previous commitments. They are willing to buy only at a price sufficiently lower than their own

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[29] To accomplish flexibility through producing products of unspecialized form and capable of storage has limited importance in resource utilization because form and storability are usually given by technical conditions. In agriculture some increase of flexibility can be obtained by substituting grains and livestock for perishable specialities such as fruits and vegetables. However, the loss of revenues is usually so great that it is impracticable.

[30] Individual foresight includes judgments about uncertainty prevailing in different instants and the reaction to these judgments. It also implies a decision about the number of instants for which revenue and cost schedules are taken into account. Individual foresight is limited. Individuals have an "economic horizon," to use Tinbergen's term. Costs for reliable information and allowance for uncertainty increase gradually with increasing remoteness of instants in the future until at the economic horizon all points of the revenue curve are below the cost curve so that the instant is of no interest for the utilization plan. Future instants cease to affect those decisions which are of minor importance first, then those of major importance, and the most remote instants are taken into account only for the most important decisions. Cf. J. Tinbergen, The notions of horizon and expectancy in dynamic economics. Econometrica 1(3): 247–264; and A. G. Hart, op. cit., pp. 80–83.

[31] Most futures markets extend not more than a year into the future. They are important for traders in resources already produced but not for producers in their decisions with respect to conservation and depletion.

expectations to make a speculative profit. The more distant the instants for which contracts are to be made, the greater is the uncertainty of buyers and the lower the price they are willing to contract for immediately. Present prices for more distant future deliveries will soon become so low that producers will prefer not to hedge.[32] Before this point is reached numbers of buyers and sellers have become too small for a perfect market. Because of uncertainty, contracts for the more distant future are made on a highly individualistic basis after each party has made a thorough study of the other party's business in relation to his own. It may be concluded that the utilization plan is based largely on individual foresight, and not on objective factors established by coordination of the subjective factors through a perfect market for futures. It will be shown presently that the same holds for the relation between individual rates of time discount and market rates.

3. *Changes of time discount rates and the importance of individual time preference*

Little needs to be said about the effect of changes in expected time discount rates[33] upon the utilization plan. A decrease in time discount rates used in individual utilization plans will bring about conservation and an increase will result in depletion—expectations of revenues and costs and individual foresight remaining unchanged.[34] A decrease (increase) in time discount rates may be looked upon as an upward (downward) shift of expected revenue schedules (total, average, and marginal) in all instants to an extent which is proportional to the remoteness of each instant in the future and equiproportional for all points in each schedule; an opposite shift of cost schedules takes place because of decreased (increased) service costs of durable factors. It becomes economical, therefore, to increase (decrease) rates of use the more, the further instants are removed in the future. By definition this means conservation (depletion).

The effect of changes in time discount rates upon conservation and depletion is not the only problem which is of interest here. It is essential to know, particularly for public conservation policies, how

[32] Cf. also J. R. Hicks, op. cit., p. 139.

[33] Usually one rate is used. This, however, is only a special case. There are cases in which different rates are used over different ranges of instants.

[34] The difficulties of clearly separating changes of individual time discount rates and of individual allowance for uncertainty are discussed below.

time discount rates used in individual utilization plans are determined. How far are they individual rates and how far market rates of interest? Some recent confusion in the field of conservation economics makes it necessary to deal with this problem in some detail.[35]

We are told that individual utilization plans are determined simply by "the" market rate of interest, any role of individual rates being ruled out through appeal to "economic doctrine." This comfortable platitude is not only meaningless but confusing because it evades a number of problems which are extremely important in any realistic approach to the economics of conservation. The first problem is that the above statement implies the assumption not only of a perfect market for money loans[36] but also of a perfect market for all productive services including labor of the entrepreneurial family, managerial ability, occupational knowledge, land, and natural resources. In economic reality this assumption is almost never justified. The reasons will become clear presently. The second problem follows from the first. It is the question of which time discount rate is used in individual utilization plans if the markets just mentioned are not and cannot be made perfect. The third problem is of particular importance for public conservation policies. It relates to the factors which affect changes in individual rates if the latter, and not market rates, are used in individual utilization plans.

In the clarification of these problems time preference concepts are an effective tool of economic analysis.[37] Individual time prefer-

[35] This confusion is exemplified by the article of Mr. Bunce cited above. The article is noteworthy for ignoring or omitting to cite relevant portions of the writings of authors who are criticized. (Cf. points enumerated on p. 539 which are almost verbatim identical with those discussed by the present author in previous papers.) Besides, there is a tendency to substitute deliberate misinterpretation (cf. footnote 8) and aggressive formulation for scientific argument. With respect to the latter, any use of time preference concepts is brushed aside simply through: "There is no basis for it in currently accepted economic doctrine" (p. 534). More specifically the argument is stated in these terms: "I find it impossible to understand where the individual's time preference plays any part in the action of a producer if we assume economic behaviour. If the individual's time preference is less than the interest rate then he will maximize his returns and save, if his time preference is greater than the market rate of interest he will maximize his returns and borrow" (p. 538). What is meant by "market rate of interest" and by "economic behaviour" is not stated. About the implicit assumptions only a vague reference to a "perfect capital market" is made (in a footnote of 1½ lines on p. 536).

[36] A perfect commodity market was defined above. A perfect market for money loans is defined analogously as a market in which all individuals can borrow or loan any desired amounts of money at the prevailing rate of interest.

[37] Time preference concepts have constantly played an important role in interest

ence means that unequal amounts of goods and services in different instants have the same utility in a given instant, the latter usually taken as the present. Time preference may be expressed as rate of goods and services. The rate may be positive, negative or zero, and may differ for different instants. The individual may also have different rates for different goods and services. In an exchange economy rates are expressed in terms of money. Although the following discussion is in terms of money rates of time preference, it should be kept in mind that this is only a special case. The problem of time preference is not confined to an exchange economy and a shift in emphasis from money to commodity rates is sometimes necessary in the economics of conservation.

The individual compares utilities at the margin and endeavors to arrange the distribution of expected units of goods and services and of money over time in such a way that the marginal utility of a unit is equal in all instants from the standpoint of the present. Marginal and average utilities will usually not be the same. The money rate of individual time preference, which expresses differences between rates of individual money income[38] in different instants which have the same present marginal utility, is, therefore, usually influenced by the rate of individual money income. With respect to the functional relation between rate of individual money income and marginal utility of money we may make the usual assumption that marginal utility decreases with increasing rate of money income monotonically, that the decrease is large at low income rates, and that it becomes smaller as income rates increase. We may also assume that time preference at low income rates is large, and becomes smaller as income rates increase. The importance of these assumptions for the economics of conservation will appear later.

It is essential now, as with individual foresight discussed above, to know how far purely subjective individual time preference rates are coordinated through the market for future delivery of money, that is, through the market for money loans. In this market interest

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and capital theory from Böhm-Bawerk's Kapital und Kapitalismus (I vol., 1884; II vol., 1889) to Keynes' General theory (1936)—whether Mr. Bunce "finds it impossible to understand" or not, and regardless of his knowledge of "currently accepted economic doctrine." More detailed reference seems superfluous because every elementary text on economics contains a discussion of time preference (for a most recent [1941] example, compare the good text by Albert L. Meyers).

[38] Income should be clearly differentiated from revenues and net revenues. Income includes all returns of an individual from labor, managerial ability, and investments in all lines of activity.

rates and not market time discount rates are formed. Interest rates include an allowance for uncertainty on the part of the lender about the ability and sometimes the willingness of the borrower to fulfill the loan contract and an allowance for the costs of concluding and administering the loan contract.[39] A great many interest rates may, therefore, be coexistent with one hypothetical market time discount rate. This tends to break up the market into small individual segments. The individuality of the loan contract because of uncertainty and costs becomes important in relation to another characteristic of the loan market. Loans are generally not extended beyond a certain ratio to the value of the borrower's assets. By varying this ratio directly or by varying the principles governing the appraisal of assets, or by stipulating that a proportion of assets must be in a certain form (land, buildings, goods on hand, cash), lenders have the possibility of rationing the amount of loans. This possibility could, of course, not be used if lenders were in perfect competition with one another. However, actual lenders, in contrast to savers, are few and well organized in comparison to borrowers. This in connection with the individualistic nature of a loan contract makes it possible to discriminate between borrowers not only through differentiation of interest rates but also through rationing the amount of the loan. It can safely be said that for the great majority of resource users in agriculture, forestry, and mining, no perfect loan market exists. This holds for societies with a well developed loan market in periods of general economic confidence. It is still more true if more primitive societies and the effects of short-time and long-time economic fluctuations are considered. The economics of conservation is concerned with all these conditions.

It is implied in the oversimplified version of "economic doctrine" mentioned above that individual time preference does not influence the utilization plan even if loan markets are imperfect. A resource user may not be able to borrow at a prevailing interest rate, but he may sell all or a part of his productive factors priced

[39] It is impossible for the lender to make allowance for uncertainty in the manner discussed above not only because he cannot familiarize himself sufficiently with the borrower's business but also because he has other uncertainties to consider. Among the latter are especially uncertainty about his own needs and uncertainty about changes in the market rate of interest itself. Cf. also Keynes' discussion of "liquidity preference" based on the "transactions," "precautionary," "financial," and "speculative motives." (J. M. Keynes, The general theory of employment, interest and money. Chap. 15. New York, 1936; and, The "ex-ante" theory of the rate of interest. Economic Journal 47(188): 663–669.)

on the basis of that rate if his individual time preference rate is higher. Conversely, if his time preference is lower, he may not be able or willing[40] to lend at the prevailing rate, but he may buy productive factors priced on the basis of that rate.[41] Usually, however, the costs of transferring productive factors are high, if it is technically possible at all, because of immobility, indivisibility, and specialization. Changes of individual time preference, on the other hand, may make alternation between investment and disinvestment in productive factors desirable for the same individual in relatively short intervals.[42] Under such conditions it is often more economical for a resource user to disinvest in productive factors through depletion than through sale, and to invest in productive factors through conservation than through purchase. This is only another way of saying that the individual resource user takes his time preference rate as basis for making decisions about the distribution of rates of use over time.

To emphasize that individual rates besides market rates must be considered in the economics of conservation does not, of course, mean that the causes of market imperfections should not be studied and so far as possible and desirable removed.[43] However, removal of the most relevant market imperfections rooted in uncertainty of expectations and in the indivisibility and immobility of productive factors is impossible. Generalities, falsely called economic theory, based on the assumption of perfect markets are dull tools of economic analysis. Economic analysis does not need to capitulate[44] before imperfect markets, but needs refinement particularly in the economics of the individual firm and in the economics of social action. Time preference concepts are helpful in both. The topic assigned confines us to the former.

We may now ask what factors affect individual time preference. Changes in individual time preference may occur because utility schedules of money have shifted[45] or because changes of rates of individual money incomes have occurred.

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[40] Because his allowance for uncertainty is greater or additional costs are involved.

[41] If he wants to lend, he must also sell some or all of his assets.

[42] The difference between investment and disinvestment on one hand and conservation and depletion on the other was explained above (Section 1).

[43] Cf. S. v. Ciriacy-Wantrup, Land-use planning or land-use policy in the United States. Agricultural Engineering 19(6): 261–3.

[44] Capitulation is held out as the only alternative when Mr. Bunce states: "If this generalization (quoted above in footnote 35) cannot be maintained, then we are faced with a choatic and irrational world in which subjective factors make any theoretical analysis impossible" (pp. 538–539).

Position and shifts of utility schedules of money in different instants are influenced by a great number of factors among which are age, health, family conditions, social position, social institutions including the framework of religion, law, custom, and many others. Their influence may be grouped in various ways. The usual differentiation between shifts caused by changes in utility of money in consumption and productivity of money in investment is of little help in this connection.[46] Changes in productivity of money in investment affect individual time preference ultimately through changes in utility of money in consumption. Besides, utility of money in consumption and productivity of money in investment are intricately intertwined in their effect upon individual time preference. All individuals are consumers as well as producers. Their attitude toward the future is affected by both points of view.[47] It is impossible, for instance, to distinguish whether purchase of durable goods is desired because of their utility or their productivity. Many durable goods serve production as well as consumption. The same is true for the purchase of services. How far is purchase of education and recreation consumption or investment? The factors mentioned and other are important causes for conservation and depletion and need to be taken into account more than heretofore in public conservation policies, but a detailed discussion of the influence of each would lead us too far afield. The sister social sciences, particularly sociology and anthropology, have an important function to perform in this connection.[48]

A greater degree of generalization is possible with respect to the

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[45] In conformity with the previous discussion we have in mind shifts based on certain expectations. It may be argued that psychologically the causes for these shifts cannot be separated from uncertainty. Whatever the justification of this argument may be, it is useful for the purpose of exposition and economic analysis to separate "certainty preference" from time preference.

[46] Fluctuations in general purchasing power of money affect individual time preference through changes in utility of money in consumption, productivity of money in investment, and in addition through changes in rates of individual money incomes. (Cf. Irving Fisher, The rate of interest; its nature, determination and relation to economic phenomena. New York, 1907; F. A. Fetter, Interest theory and price movements. American Economic Review, 17 (1, supp.): 62–105.

[47] Although we are not concerned here with the theory of interest, it may be mentioned that a sharp differentiation between time preference theories of interest (Fetter, Fisher, Pigou), productivity theories of interest (F. H. Knight, Schumpeter), and liquidity preference theories (Keynes) seems artificial for similar reasons.

[48] Many interesting observations on factors affecting utility schedules can be found, for instance in: Melville J. Herskovits, The economic life of primitive peoples. New York, 1940; D. M. Goodfellow, Principles of economic sociology; the economics of primitive life as illustrated from the Bantu peoples of South and East Africa. Philadelphia, 1939; and, A. I. Richards, Land, labour and diet in Northern Rhodesia; an economic study of the Bemba tribe. London, 1939.

influence of changes in rates of individual money incomes in different instants upon individual time preference. It follows from our two previous assumptions with respect to the relation between marginal utility of money and rate of individual income that increases and decreases in the rate of individual money incomes expected for any one instant change individual time preference with respect to this instant,[49] that decreases (increases) in rates of individual money income expected for all instants decrease (increase) individual time preference, and that these effects will be the greater, the smaller rates of income are. This is important because it throws light on many complex problems in the economics of conservation. Among these are the effects upon conservation and depletion of prosperity and depression and of the entrepreneur's income level. The effects of fixed charges, of taxation, of size of enterprise, and of tenure appear in a clearer light. An interesting and important paradox in resource utilization is explained: Downward shifts of revenue schedules and upward shifts of cost schedules do not lead to decreases but to increases in rates of use if the changes in individual time preference resulting from these shifts are strong enough to offset the effect which would occur if markets were perfect. Fixed charges in combination with decreasing prices or rising costs often force forest or mining enterprises into uneconomic depletion. This paradox occurs also frequently in agriculture but it is not confined to industries in which self-employment plays an important role. It should be clearly differentiated from a similar paradox which occurs in the latter industries.[50] The first paradox is a problem of production over time; the second may occur in instantaneous production. In the first, incomes in other instants are drawn upon; in the second, leisure of the entrepreneurial family, which may be regarded as a form of income, is transformed into money income.

IV. Conclusions with Respect to the Relation of Private and Social Economics of Conservation

Time did not permit presenting more than the barest theoretical outline of the private economics of conservation. For the same

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[49] These changes in individual time preference may be increases or decreases or both (over different ranges of instants), depending on the location in time of the instants considered.

[50] S. v. Ciriacy-Wantrup, The relation of war economics to agriculture with particular reference to the effects of income and price inflation and deflation. American Economic Review, 30(1, part 2): 366–382, particularly p. 374 ff.

reason development of practical approximations, application to situations in different resources and discussion of a number of theoretically intriguing side issues had to be left for another occasion; the same is true with respect to the social economics of conservation and to conservation policy in particular.[51] In closing we may say, however, that the same theoretical framework can be employed in the social economics of conservation provided that revenues, costs, and time discount rates used in determining the optimum state of conservation from the standpoint of society are properly redefined. Such a redefinition is hindered by the same economic doctrines which were shown above to hinder realistic development of private economics in view of imperfect markets.

It was emphasized elsewhere[51] that social revenues and social costs are not merely the sum of private revenues and private costs, but contain elements which do not appear at all in the latter. These elements are based on social revenue and cost schedules which represent a coordination of the preference system of individuals in a different way than market demand and supply schedules. One does not need Hegelian philosophy of the state for establishing differences between social revenue and cost schedules and market demand and supply schedules. The difference is not one of "rationality" or "freedom" of choice but a difference in the means through which individual preferences find expression and in differences in the ways in which social schedules are implemented in economic decisions. It can even be argued that the institutional mechanisms which enable expression of individual preference systems in decisions by society based on social schedules guarantee for weaker economic groups a greater degree of "freedom" than institutional mechanisms enabling decisions based by so-called "free" interplay of forces in the market.

The rate of time discount requires the same redefinition if used in social economics as revenues and costs. Here again the time preference concept is useful. If tangible or intangible social goods and services such as roads, canals, parks, defense, education, public health, etc., are to be provided, the problem has to be faced that equal amounts of these goods and services in different instants may have unequal social utility in the present. This inequality is expressed through social time preference which may be positive, negative, or zero, and is defined in analogy to individual time

[51] S. v. Ciriacy-Wantrup, Land conservation and social planning. op. cit. p. 111.

preference.[53] It may or may not be expressed as a rate. For the authorities who implement social preferences it may sometimes be convenient to have it expressed as a money rate. Individuals participate in establishing social time preference through the same institutional mechanisms through which they participate in establishing social revenue and cost schedules. Social time preference is not any more coordinated through a perfect loan market than individual time preference. On the contrary, social borrowings are a historically important cause for imperfections of the loan market because of the size of these borrowings and because of the power of governments over individual savings, the banking system, and monetary policy. The rate to be used by society is, therefore, not simply "the current rate of interest which equilibrates savings and borrowings."[52] Further discussion of these problems must be left for another occasion.

[52] A. C. Bunce, op. cit., p. 536. The vague notion of "the current interest rate" (which?) equilibrating savings and borrowings must not be confused with Wicksell's helpful concept of "natural rate."

PUBLIC POLICY AND ACTION FOR CONSERVATION

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Budget Allocations and Policy Formulation

IN A DEMOCRATIC SOCIETY budget allocations to specified projects are made by the elected representatives of the people, and the size of the allotment reveals the judgments of these representatives as hammered out through committee proceedings, in which are reflected economic pressures, political pressures, and value judgments. In this process, pressure groups and special interests all attempt to obtain favorable action; after a project or program has once been started and its funds are allocated annually the action agency itself develops an interest in perpetuating its work and increasing the allocation of funds for its use. When funds are first allotted to a project the end stated is usually broad in scope and there may be very little information available upon which intelligent judgments can be made. Once the program is in operation, however, information that forms a better basis for judgment is collected by the action agency and presented to obtain the most favorable action by congress or its committees. Since all agencies tend to compete for limited funds this desire to retain public confidence encourages efficiency and the formulation of policies that will meet with the greatest public approval. At this level the statements of ends to be pursued are necessarily broad and couched in common sense terms rather than in exact scientific language; policy formulation must include, therefore, not only a selection of means, but also to a large degree a re-definition in more exact terms of the ends to be pursued.

It is in this institutional framework that we must ask the question, Who shall determine policy, define the specific ends, choose between alternative allocations of funds, and select the means to be used? Essentially it is the problem of relating planning, action and research in such a way that conflicts between the ends and means of different action programs shall supplement rather than conflict with each other. For this to occur it is essential that planning or policy formulation be centralized in one body and not left to individual action agencies which might initiate actions that would tend to conflict with those of other agencies. This problem is particularly important in the case of an objective stated in such terms

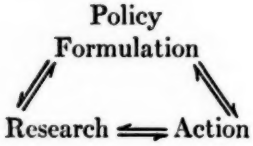
as "the conservation of our soil and water resources." Conservation becomes a term with moral connotations; it becomes purely physical in content and includes land improvement; it is completely divorced from any economic interpretation. In the general law allocating funds we find no key as to which conservation objectives shall have precedence, and policy formulation has a very wide scope. Again, in the case of conservation, we find that numerous other programs can be used to further this broad end and that in some cases policies adopted by other agencies might result in an increase in erosion. In the case of the agricultural adjustment act, conservation as an end is associated with the end of attaining "parity prices" and the possibility of conflicts between these ends is inherent in the one agency.

Policy Formulation As a Dynamic Process

Where social action is necessary to meet an immediate problem, and facts are not available to make a fully informed decision, we have to develop techniques of estimation so that we can evaluate the results of initial activities in order to modify the program in the light of further information. In this sense planning becomes a continuous and changing process in which action leads to information upon which more intelligent action may be developed. For this process to take place, flexibility of specific action programs must be maintained and there must be a willingness to change on the part of those formulating policies.

Research has the functions of discovering facts and relationships that lay the foundation for intelligent policy formulation, of analyzing the results of present action programs in order that policies may be improved in the light of experience, and of investigating specific problems that are encountered by the action agency or agencies designated to further conservation policies.

These three functions must be kept independent but inter-related if public policy and action for conservation is to become progressively more effective in attaining the desired end. The relationship may be shown in the form of a triangle with policy formulation, action, and research at the three corners connected with each other by a two way flow.



Where research is dominated by an action agency, its whole effort may be devoted to solving immediate practical problems with no time given to the more fundamental problems needing investigation in order to improve policies; independent analysis of current actions that implies criticisms may not be permitted. Where policy formulation is dominated by an action agency, bureaucratic inertia and personal preference, based upon familiarity with current policies and procedures, may prevent adjustment and changes from occurring. On the other hand the experience and advice of the action agency is essential to those formulating policy especially when it can be filtered through an independent research organization.

So far this discussion has centered upon public policy and action at the federal level where certain basic policies and decisions have to be made. At the other extreme end of the chain linking congressional actions and results is the individual farmer upon whom the action programs impinge. He may play an important part in policy formulation or he may simply be a neutral participator. In general it may be stated that individual participation in policy making can be achieved either by an organized flow of ideas and criticisms from the farmer to the planning group or by such a decentralization and flexibility of action that local groups can initiate policy and direct it. The county agricultural planning committees represent an organized flow from farmers to the B. A. E. while a soil conservation district represents a decentralization of authority and planning. The effectiveness of either of these methods in bridging the gap between individual and social interests will depend upon the ability of the individuals to see the social interest and the ability of the policy makers to understand and appreciate the individual's problems; it will also depend upon the kind and degree of conflict that exists and the basic causes underlying the divergence between individual and social interests.

Conservation As an End

Conservation can not be looked upon as an independent end in itself; it is part of the larger problem of allocating resources so that social net returns are maximized. In the case of soil and water conservation it is not enough to think of planning purely in terms of the elimination of erosion but we must also think in terms of farm income, the relationship of primary (crop and feed) production to secondary (livestock and processing) production, the ability of the farm to adjust to price changes, and the institutional framework if

the conservation system is to be permanent. These relationships vary widely just as the degree and rate of erosion and its social significance vary widely. Conservation policy, therefore, can not be based upon the concept that conservation is everywhere equally desirable or that it is simply a physical problem. Once the funds are allocated by Congress to the broad general end of conservation, decisions have to be made regarding the allocation of those funds to obtain the maximum amount of conservation, consistent with the end of maximizing social net returns. In order to make these decisions the general end of conservation has to be broken down into more specific ends with economic connotations.

In a previous article[1] an attempt was made to break down the general end of conservation into more specific ends which might form the basis for policy decisions. The major points are briefly summarized here in order to provide a background for a more detailed discussion of the practical problems of measurement involved.

Soil conservation in a physical sense means the maintenance of the present productivity of our soils into the future. As generally used, however, the term includes soil improvement. From the point of view of social interest we need to distinguish between fertility depletion and soil deterioration. In the case of exploitation leading only to fertility depletion the depleted resource can be restored and no permanent damage results; capital has great substitutability for land under these circumstances and social interest lies in maximizing production not in conservation. Where exploitation leads to fertility depletion and soil erosion the basic soil resources may be destroyed and can not be rebuilt; in this case there is little substitutability of capital for land and social interest lies in conserving these resources so that social net returns are maximized over time. This distinction is fundamental to the formulation of conservation policies particularly during an emergency period when soil depletion may be desirable in order to increase production in the present at the expense of production in the future.

In the case of soil deterioration and erosion the exploitive system may or may not be economic to the individual or society and conservation ends must be related to this economic problem if policies most beneficial to society are to be evolved. This may be done by stating the specific objectives of conservation policy as follows:

[1] See Society and conservation, Land Policy Review, vol. IV, no. 6, June, 1941.

1. To introduce conservation or improvement in those areas where it is economic to the individual. Where conservation or improvement also increases social net returns by eliminating social losses from floods, silting, relief, etc., the total social benefits from the expenditure of public funds is increased. Social net returns will be increased by public expenditures in conservation or improvement until the marginal costs equal the marginal returns. Such a statement, however, has little meaning in solving problems where the relationship of returns to costs is difficult to determine and there is no "market" for government services and costs are essentially opportunity costs. The best practical guide to policy is that precedence in the allocation of funds should be given to those areas where the social benefits will be greatest.

2. A second objective would be to induce conservation or improvement in those areas where it is economic for society but not for the individual. Under these circumstances the individual must receive compensation to make up the loss in income resulting from adopting conservation or be coerced. Society will benefit from the elimination of certain damages and social net returns will be increased so long as the sum of the damages eliminated is greater than the sum of the individual losses induced plus the costs for establishing the program. In both the above cases, costs and benefits can be calculated in terms of annual flows or quantities of capital and it is a matter of indifference which is used provided that the same procedure is applied to both costs and returns. For a conservation project in this class to have priority over one that would fall into the first objective the social gains would have to be large or the individual losses small.

3. The third objective would be to induce conservation or improvement in those areas where it is not *economic* for the individual or society but is desired by society for intangible reasons. In this case there are no economic criteria that can be applied to determine the precedence of one project over another and decisions have to be made on the same basis as that used by consumers, who select that expenditure which they think will prove most satisfying. Essentially such expenditures represent consumption purchases by society and greater refinement in the allocation of funds can only be made as we develop improved techniques of measuring public opinion.

Mere classification of ends does not solve the problems of public policy; it only reveals the nature of the estimates that must be made and lays a foundation for selecting appropriate means. Stating ends more explicitly and breaking down broad generalizations is of no assistance to action planning unless the ends are determinate.

Problems of Measurement

The end of achieving conservation or improvement in those areas of soil deterioration where it is economic to the individual only has meaning for conservation policy and action if we can delineate them. To do this we must make a budget analysis of the present exploitive system and the conservation system. This budget must include the following estimates:[2]

1. The capital loss from continued exploitation.
2. The difference in net income under the two systems.
3. The cost of establishing the new system and the final balance.

The major difficulties in making these estimates lie in our lack of exact information on the physical results of specific conservation measures upon yields and erosion. In spite of the fact that the estimates can not forecast accurately the exact economic effect of a conservation program they can be of value in indicating whether conservation will probably increase, not change, or decrease farm income and the approximate order of magnitude of the changes.

The determination of whether conservation is economic to the individual or not is of basic importance because of its relationship to the type of social action needed; the more economic it is the less the need for subsidies to cover losses or overcome inertia.

The second major problem of measurement lies in determining whether conservation or improvement is economic for society; this involves an analysis of the causes of divergence between social and private net returns. These causes may be summarized as (1) social costs of exploitation or benefits of conservation which do not impinge upon the individual; (2) capital losses or gains not borne by the individual; and (3) differences between the prices available to society and the individual for the use of labor and capital for conservation purposes.

[2] For a method of making these estimates see A method of estimating the economic effects of planned conservation on individual farms by Arthur C. Bunce and George Collier, U.S.D.A., Bulletin Misc. Series No. 372 (in press).

For policy formulation we need to know which of the above factors are the cause of social loss, how large the loss from continued exploitation is and the value of any positive gains to society beyond the elimination of losses; these estimates must then be allocated to the areas involved. It is this field of social accounting that many of our unsolved problems lie and the specific difficulties are related to the type of problem involved. Three cases are briefly presented here to indicate the realtionship between the causes of deviation between individual and social net returns and the problems of measurement involved.

1. An example of costs of exploitation not borne by the individual is the case of flood damage resulting from the rapid flow off of water from a given watershed and caused by the exploitive method of farming in the area. In order to evaluate the economic implications we would have to estimate:

(a) The average annual damage from floods,
(b) the changes in land use and conservation practices necessary to reduce the rapidity of water flow,
(c) the effect of these changes upon farm incomes,
(d) the cost of the program in terms of subsidies and actions necessary to induce the changes,
(e) the value of additional social benefits that might result from the program.

For a small watershed such estimates may be made relatively easily but as larger areas are included the problem becomes increasingly difficult. In any flood control program such estimates have to be made when limited funds demand the choice of alternatives. The alternative to using such estimates is to rely upon political pressure and intuition.

2. Many examples of capital losses not borne by the individual occur where there is no way of allocating a capital value to the resource. Such is the case for fisheries, game (including fur bearing animals not in captivity), and the recreational aspects of forests and streams. Under these circumstances exploitation may destroy the possibilities of future incomes in terms of goods or services. In order to determine social policy we must know in the case of fisheries:

(a) the value of the flow,

(b) the kind and quantity that may be taken without reducing the yield,

(c) the costs of control including propagation and law enforcement.

Much of this problem is biologic in nature and we have made fairly rapid progress in developing social controls to restrain competitive exploitation even when nations rather than individuals are concerned.

3. Differences between prices available to the government and the individual reflect rigidities and a lack of equilibrium with full employment conditions. If society has control over unemployed resources of capital or labor the cost to society for any given project is an opportunity cost. In the case of unemployed labor a minimum amount is allowed for relief and, if the labor is employed by the government, the cost of the labor is the wages paid less the relief costs. A private individual employing labor would have to pay the going wages and the costs of a conservation program involving hired labor would be much higher. The problem society must solve is that of allocating the unemployed labor to those projects which will give the largest returns and using it for those projects which would not be economic if they had to bear the total labor costs. In formulating conservation policies, therefore, unemployed resources should be directed to those areas where conservation would be uneconomic to the individual at current market prices. If this policy is not followed the resources might be used in areas where conservation would be economic at current rates; this would tend to reduce the private employment of such resources and those areas needing subsidies would be left to continue an exploitive system. This general guide to policy must be modified so that expenditures are allocated only to areas where conservation is economic at the lower rates and where it will continue once it is introduced. Similarly the policy assumes a continuous educational process and anticipates the growth of conservation in those areas where it is economic at current prices.

So far we have been dealing with estimates of an economic nature and analyzing expeditures as investments in productive enterprises. When we turn to an analysis of the third objective of social policy for conservation this analytical procedure is of little value. We stated this end to be the attainment of conservation or improve-

ment in those areas where it is not *economic* for the individual or society but is desired by society for intangible reasons. These reasons may range all the way from national pride to the desire to have open air recreational facilities available to all in order to counteract the influence of urbanization in separating man from his natural environment of earth and sky and living things. It is in these problems that much of our controversy lies and it has partly been due to our thinking in terms of a productive norm. I believe the whole problem can be greatly simplified if we look upon expenditures of this kind as consumption by society rather than investment. The major problem of measurement is simply the correct estimation of the cost of the projects in order that we can make better choices of alternatives, and "better" in this sense simply means spending the money on those things which will provide us with the greatest satisfaction per dollar spent. The basis of choosing is a purely subjective valuation but the estimation of costs can be objective.

One of the first problems is that of determining the allocation of joint costs when expenditures represent partly economic investments and partly consumption. This is a common situation for multiple purpose dams and forests. Under these circumstances the residual costs that can not be covered by expected income from the economic services (charged at "reasonable" prices) may be looked upon as the price of the intangible values to society. In the case of a national forest or park area the income from forest products may not cover the interest on capital values and current costs of fire prevention and upkeep; this annual loss is the price society must pay to maintain that particular area for the intangible values.

A second problem is that of evaluating present expenditures for future values when any considerable period of time elapses, and innumerable arguments for not using interest charges have been advanced. From the point of view of evaluating alternative expenditures in the present it is essential that a rate of discounting the future be used in the cost accounting. Otherwise a $100.00 spent for an immediate intangible value A would represent the same thing as $100.00 spent for the same intangible value A occurring fifty years from now. For such long time expenditures the current yield on government bonds appears to be the most reasonable rate that can be used in discounting the future. If we divorce our thinking from the productive investment concept, interest calculations become

purely an accounting device that is useful in assisting us to make choices between alternatives occurring differently in time.

Apart from the problems of measurement associated with these three specific ends, there are the problems associated with the effectiveness of the means used. Where conservation is economic to the individual the objective of policy and action is to use those means which will stimulate private action and there is no reason to anticipate any form of permanent subsidy. The means used must be related to the basic causes of the uneconomic exploitation and these range from lack of knowledge and inertia to credit rationing and insecurity of tenure. Where conservation is not economic to the individual, the selection of the means used to attain conservation must give consideration to the alternatives of coercion and subsidies and the limitations of each. Policy must also consider the reasons why exploitation is economic and we may find that it is because certain intertilled crops have a high comparative advantage at present prices and give larger returns per acre while the nearest conservation program would lower returns so greatly that the whole pattern of farm size and type might have to be changed. In this case conservation expenditures may be wasted unless the basic relationship between population and land is changed.

Analyzing the effectiveness of various means that may be used to induce conservation is made extremely difficult because of the overlapping of various programs. Most farmers who accepted five year agreements with the S.C.S. accepted not only the S.C.S. plan but also the A.A.A. payments; in conservation districts the two programs operate in this supplementary way and whether the conservation plans will be continued without the payments and at what range of prices is not known.

Out of the maze of conflicting means and ends which impinge upon the individual, and out of the complex relationships between causes of exploitation and the means to be used to induce conservation, one basic guide to policy and action emerges; action programs must be flexible and decentralized so that those participating are given a maximum amount of control over the program. This will eliminate many problems and conflicts that arise in regard to individual farm planning. At the federal level funds and services have to be allocated on the basis of judgment regarding both economic and political factors; this allocation can only be improved as we develop techniques of estimation and use them to evaluate

the probable results of conservation upon individual farm income and social costs and benefits. We also need to study in more detail the basic causes of exploitation and relate the means used to these causes. If one major cause is the great comparative advantage of an exploitive crop over the nearest conservation alternative any policies affecting prices must consider this fact. If acreage controls of erosive crops are undertaken they should be applied to the areas where soil deterioration is most serious if the objective of conservation is to be attained; if the objective is production control the controls should be applied to the areas producing a commercial surplus. In this case no rational policy can be determined unless we clearly state which end is to be dominant.

The Shortcomings of Theoretical Guides to Policy Formulation

Much of the controversy regarding "theory" is due to a misunderstanding of its function. Theory is essentially a system of tautologies based upon certain assumptions regarding human beings and institutional conditions of property rights, mobility and freedom which should reflect realities. Pure theory has little empirical content and its value lies in revealing inter-relationships betweeen segments of the economy that are not obvious from an examination of facts. Theory alone can not solve problems of social policy or action, but it can indicate relationships and outline the empirical data necessary to make economic decisions. It is the function of research to make the empirical studies and reveal their significance. Facts without theory are also unable to solve problems of policy because the inter-relationships of the facts can not be understood.

The past fifty years has seen a progressive breaking down of informal controls through mores and custom aimed largely at subjective and non-explicit ends; it has also seen a progressive development of formal controls, or consciously planned guidance of individual actions, to achieve explicitly stated objectives. This trend appears likely to continue in the future and our theoretical tools need to be developed so that they can be useful in revealing interrelationships between individual actions and social net returns.

Much of the antagonism to "theory" today results from the fact that neo-classical thought was dominated by the concept of the identity of interest between the individual and society in a competitive capitalistic economy. At the same time some theorists

became so enamoured of their beautiful structure of logic that they believed it to be the ultimate end towards which society should and must move. These factors retarded the development of a theory of social economics that is sorely needed today.

Theory can not determine the ends of society, it can only help to state them explicitly and indicate inter-relationships and conflicts. To do this theory can no longer be concerned only with a productive norm couched in terms of individual economics, it must also be concerned with social economics which must include the concept of maximizing the social net product, the distribution of wealth *as desired by society*, economic security, conservation, and any other social end established as a specific objective of social action. The major shortcomings of theoretical guides to policy formulation lies in the fact that they are at present inadequate and need to be developed along many fronts. Once this is done we can develop economic research projects that will give empirical content useful for formulating policies as well as apply the new theory to the masses of undigested empirical data that are already collected.

SOCIETY AND CONSERVATION[1]

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THE TERM conservation as used currently in the United States has two major and conflicting meanings. One usage of the term, and that employed widely if not consistently in economic writings and discourse, accepts the meaning that conservation refers to a concern of humanity for the level of production that may be maintained from the totality of resources at its command. This usage of the term focuses a special attention on inter-resource relationships that are relevant for the determination of social and governmental policy with respect to resources in general and critically exhaustible categories of resources in particular. A second, and I believe later usage of the term, drops any reference to the relationship of people and resources as a whole and speaks of the conservation of particular categories of resources such as soil or forest conservation and the like.

The presumption underlying the usage of the second type is that there may be a preservation or improvement of a particular category of resources that may be called conservation regardless of the actual or possible effect that the process of preservation or improvement may have on reserves of other categories. Thus, there is presumed to be a net conservation of resources when in the process of soil conservation terraces, dams and other structures are built at the expense of much gasoline, lubricating oil, labor and machine depreciation all of which amounts to a depletion of other types of resources. This type of "conservation" makes no attempt to prepare a balance sheet to enable the public to determine whether the maintenance or improvement of one type of resource has been at the expense of others. In fact, there is sometimes an apparent unconsciousness that such might be the case. Conservation, in other words, is conceived as something absolute rather than relative and the costs of conservation are thought of as calcuable in purely monetary terms.

The older usage is far more self-consistent and in a paper on

[1] Contribution from the Department of Agricultural Economics Missouri Agricultural Experiment Station Journal Series No. 799.

Without in any way making him responsible for my conclusions, I wish to express my gratitude to Mr. Nahum Z. Medalia, Fellow in Sociology at the University of Illinois for aid he gave me in formulating some of the central ideas in this paper.

society and conservation, its use is imperative. Indeed, society could hardly have a paramount interest in any particular type of resource or even so important a single resource as soil. Its interest is rather to devise systems of exploitation so that total output or national income may be continuously expanded on into the indefinite future.[2] It would indeed regard the maintenance and improvement of soil if made at the expense of too heavy a draft on oil as no gain whatever and not, therefore, as harmonious with a conservation policy the objective of which was the maximization of utilities in an exchange society.

Resource Classification for Conservation Policy

For purposes of conservation policy there are three bases for distinguishing or classifying resources in relation to the effect of exploitation upon them. First the reserves of resources are so different that some exist in inexhaustible amounts while reserves of others are apparently critically low. Second, resources vary in restorability after exploitation and third the durability of the products derived from them and the recoverability of usable waste products after these products are worn out vary also. To these three must be added the fact that the pressure of exploitation on various categories of resources also differs. Thus technological developments in drilling, the heavy pressure to build up rapidly a rapacious industrial system and the even more rapacious demands of war are all just now exerting a strenuous pressure on mineral oil reserves. Recent technological advances have facilitated a heavy pressure on soil as well but not, perhaps, equal to that on petroleum.

Based on these distinguishing features the following classification is designed to facilitate the apprehension of the interrelationships of resources that are important for conservation policy.

Resource Classification

Designed to Reveal Inter-Resource Relationships Relevant to Conservation Policy

I. Available Resources
  A. Exhaustible Resources
    1. Amounts suitable for exploitation
      a. Large reserves
        1) readily available substitutes

[2] Assuming the lesser ideal of mere maintenance of output to be unnecessary.

2) no known substitutes
b. Moderate reserves
1) readily available substitutes
2) no known substitutes
c. Small reserves
1) some substitutes available
2) no known substitutes
2. Restorability subsequent to exploitation
a. Easily restorable
b. Non-restorable
3. Durability (of derived products) in use
a. Highly durable
1) highly recoverable
2) moderately recoverable
3) non-recoverable
b. Moderately durable
1) highly recoverable
2) moderately recoverable
3) non-recoverable
c. Non-durable
1) highly recoverable
2) moderately recoverable
3) non-recoverable

B. Inexhaustible Resources
1. Unlimited in amounts
a. Self-renewing
b. Non self-renewing
2. Limited in amounts but self-renewing
3. Substitutable for exhaustible resources
a. Highly
b. Moderately

II. Non-available Resources
A. Awaiting discovery
B. Known but unusuable pending technological developments
C. Known but unusuable pending economic and social developments.

This classification is, I believe, much more comprehensive than previous classifications that have been proposed.[3] The two major

[3] See previous classifications by (1) R. T. Ely, in Foundation of national prosperity, Macmillan, 1917, p. 35. (2) L. C. Gray, The economic possibilities of con-

divisions of resources are the available and the non-available. This feature of the classification draws attention to one point hitherto unremarked. Resources, considering the indestructibility of matter and energy and the indefinite extent of time and the universe, are actually infinite in amount. The critical question for mankind is usability and availability. A constant extension of human ingenuity in the use of materials of all kinds insures increasing availability of resources as time marches on. Silk purses can now be made from much lower grade materials than sows ears. A quarter of a century ago, soil fertility was so little understood that a great scientist could foresee ahead an almost inevitable period of hunger. Now fertility elements are a much lesser problem. They exist in inexhaustible amounts and are, on the whole, readily available. Recent developments have greatly increased the range of materials from which fibers may be made and new energy sources are persistently being uncovered. That is, the availability of resources is constantly being increased by science and an optimist could find reason to believe that the advance of science is the hare and exhaustion of resources the tortoise in the race between availability and exhaustion of resources.

However, while there is no lack of resources (only lack of availability), there may still be need for concern over our problem of conservation because of the many unknowns in the situation. How rapidly will science increase the availability of resources? How will this rate compare with the rate of exhaustion of the exhaustible resources? What reserves of these exhaustible resources do we still have? Since the rate at which science increases availability, the rate of exhaustion and even the reserves of resources are largely unknown and still unmeasurable, these questions cannot be answered. Conservation therefore is a counsel of caution: a better-be-safe-than-sorry concern of humanity for its resources.

Despite the fact that resources as a whole cannot be exhausted, certain categories may in time be fully exploited as such. That is, the higher lying resources of coal and oil may be reduced to carbon dioxide and ashes. Topsoil is removed by erosion and deposited out of reach in the ocean. In a thousand other ways availability is destroyed. Conservation is the term used as the general label for

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servation, Quarterly Journal of Economics, May 1913, pp. 497–519 and (3) Conrad H. Hammar, Economic aspects of conservation. Journal of Land and Public Utility Economics, August 1931, pp. 282–290.

the thousand and one ways of mitigating or circumventing this decline in availability.

While the specific ways of combating the loss of availability are too cumbersomely numerous to be listed, they may be classified into three major categories. First is the search for substitutes, second the restoration to productiveness of resources that have been exploited and third is the process of recovery of materials already used and putting them into shape to be used again. In brief, the key words in a conservation program are availability, substitutability, restorability, and recoverability. The programs of any of the conservation agencies can be interpreted in light of these four.

The above classification was designed to be used for the purpose of determining how critical was the need of society for concern over particular categories of resources. The non-available resources present some interesting problems but lack of time will necessitate reserving their discussion for some later opportunity. Concern for inexhaustible resources is necessary only because these are actual or potential substitutes for the exhaustible. Resources existing in unlimited amounts cannot be wasted and self-renewing resources cannot be worn out. These are precious characteristics and it is fortunate that so many important resources are of this type. Sunlight, water power sources, the elements of soil fertility, air movements, brick clay, cement materials, carbon dioxide, nitrogen, and a great additional list are resources of this category.

Some of the resources of this type are, furthermore, substitutable for those in the exhaustible category. Water power substitutes for coal, brick and cement for wood and steel in construction, etc. As and if exhaustible resources dwindle in amount there will be no choice but to shift the impact of production increasingly onto the inexhaustible categories. This matter of the substitutability of the inexhaustible is therefore, one of great importance. Considerations of restorability and of recoverability, however, either do not occur at all in connection with the inexhaustible resources or are matters of moderate concern only.

The critical problems of conservation are those that are posed by the possibility of the loss or serious deterioration of the exhaustible resources, particularly of those exhaustible resources for which reserves are small and substitutes few. It is in connection with resources of this kind that restorability and recoverability are matters of importance. Restorability as used herein refers to the ease

or difficulty that is experienced in restoring depleted resources to a higher level of productiveness. Recoverability refers to the degree to which worn out fabricated materials may be recovered for reprocessing and further use. No intelligent conservation policy can be formulated till the facts of restorability and recoverability are well understood. Resources that are easily restorable present a different problem than those that cannot under any circumstances be restored. Likewise economy in the use of materials that are easily recoverable is less necessary than for those that are strictly unrecoverable.

Perhaps the whole matter of the importance of substitutability, restorability, and recoverability for conservation policy can best be illustrated by citing certain concrete situations. The United States is at present concerning itself less with the preservation and maintenance of its oil or petroleum than for its soil. We have a large well-financed Soil Conservation Service but no equally powerful arm of government to concern itself with oil. Judging the situation by the criteria implied by the classification above will permit a contrast of soil and oil in relation to conservation policy.

To begin with the reserves of oil can hardly be judged other than small in relation to reserves of soil, the needs of a great industrial economy considered. Some substitutes for oil are apparently available. That is, some vegetable oils and alcohols may be used for fuel and lubrication and some manufacture of synthetic oil is already taking place in Germany. Great quantities of oil may furthermore be extracted from shales but in relation to the cost for petroleum as at present, these substitutes are still expensive. For soil there are virtually no substitutes.

Soil relative to oil is easily restorable. The fertility elements exist in unlimited amounts and are reasonably well distributed over the earth's surface. Oil is quite clearly non-restorable and is reduced in use to such forms that it is equally non-recoverable. Most oil is used as fuel and the resulting carbon dioxide is virtually valueless since the atmosphere already contains an abundance for plant use. On the other hand, most products obtained from the soil are, after use, returned to it in one form or another so that reserves of fertility are held more nearly constant despite the rate of exploitation.

On many, perhaps most counts, therefore, society's concern for oil should be as great or even greater than for its soil.[4] But greater

[4] Only if the term conservation is accepted as a virtual synonym of maintenance is it possible to believe that mere soil "conservation" is securely conservation.

still is the need to establish a conservation program that is balanced with respect to all resources and such balance can be obtained only if based upon a comprehensive appraisal of the whole range of characteristics of such resources as these relate to conservation policy.

Conservation Objectives

These matters of substitutability, restorability, and recoverability have a further meaning for conservation policy. The heavy emphasis on mere preservation that one so often encounters in conservation discussions has some point.[5] There are times when society has no choice but to cut down on consumption if a "counsel of caution" is to be employed. Ise argues strongly for higher taxes and higher prices to curb the consumption of petroleum products in his book on United States oil policy.[6]

On the whole the objectives of conservation must be almost exactly the contrary, however. That is, the true objective must inevitably be the maximization of national income within, however, the limits of prudence set by the outlook for substitutes and the restorability of the resources on the one hand and the recoverability of used products on the other. The advantage of the view of conservation that centers attention on inter-relationships between resources is that it permits a much clearer definition of objectives than was formerly possible. Obviously there is no need for economy of the inexhaustible. Indeed economy of these may be inimical to the real interests of conservation. Only in cases of small-reserve exhaustible resources with none but high cost substitutes in sight, little or no possibility of restoration of the resource itself, and an equally poor outlook for recovery of derived products, is the policy of continence in consumption imperative.

Much obvious confusion in the field of conservation is apparent because the conservationists have been unable to state clearly when a restrictive and when an expansionist or developmental policy

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Bennett in his recent and otherwise exhaustive book on Soil conservation failed to provide a definition of conservation worthy of the name. He does not fit soil conservation into a general scheme of resource conservation and the Soil Conservation Service apparently makes no attempt to fill in that omission.

[5] Ely for instance states at one point that "Conservation, narrowly and strictly considered means the preservation in unimpaired efficiency of the resources of the earth. . . ." See Page, Ely, Leith, Hess, and Carver. Foundations of national prosperity, Macmillan Co., 1917. See also the article by L. C. Gray, Economic possibilities of conservation, Quarterly Journal of Economics, May 1913 in which the emphasis on continence in consumption is pronounced.

[6] Yale University Press, 1926. See Chapter XXX.

should be followed. Pinchot confounds the two in his statement that "The principles of conservation thus described—development, preservation, the common good—have general application that is growing wider."[7] In actual fact, development must indubitably run counter to continence in consumption and the two are therefore in conflict. Where uncertainty exists only a detailed study of resources with the classification offered herein in mind will reveal with exactness when the policy should be to develop and when to preserve.

Such a close study should do much more than indicate merely when to develop and when to preserve, however. Income is a flow of goods and services and the rate of flow, over any given period, determines the size of the income. Social control cannot be effectively established and enforced unless there can be presented a convincing picture of the need for control. Considerations of conservation policy have, heretofore, not hindered exploitation very seriously though oil proration is laying a heavy hand on petroleum production in some sections. Developing through research a surer grasp of substitutability, recoverability and restorability will alone enable society to determine effectively what rate of exploitation of particular types of resources is advisable. One need not be too sanguine about the effectiveness of the needed research to presume that it could provide a basis for the establishment of policy superior to that which society now possesses.

Society and the Conservation Program

The gist of the discussion above has been that a conservation program to the extent that it is expansionist, and that is its important aspect, will be a program of investment. In general, this investment program will be one designed to facilitate the use of the inexhaustible resources. Particularly will it need to be such as to enable humanity to make greater use of energy sources (only a small fraction of available sunlight is now put to use for instance) since with increasing energy available the exhaustion of scarce resources is made a matter of dwindling importance. In fact, whenever mankind has such a command over nature that virtually unlimited amounts of energy are available, concern over the exhaustion of a particular category of resources will be at an end.

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[7] The fight for conservation. Doubleday, Page and Co., 1910, p. 49.

Such generalizations while of eminent long run significance are too broad to be of much immediate use in designing a program of conservation for society, however. What are needed, of course, are much more specific proposals relating to (1) types of investment that are currently feasible, (2) the setting up of machinery to facilitate the making of such investment and (3) establishing criteria for judging the amounts of investment in conservation construction and operation that may prove feasible.

With respect to types of currently feasible investment one preliminary step will have to be presumed. That is, society will not know how to devise its conservation investment scheme until it has made a dispassionate analysis of each resource in its relation to all on the bases outlined above. In many cases investment will be for restoration as in the case of forest restoration. Occasionally it will be for purposes of recovering waste or used materials. In other instances, investment may be needed to investigate the feasibility of the resort to substitutes.

This last type of investment is neatly illustrated by problems presented by the need for petroleum substitutes. Many questions that should be probed long in advance of mineral oil exhaustion have already been raised. Perhaps the most effective substitute will be shale oil but how effective is a matter that needs yet to be settled. The shock of moving from an economy lubricated by an abundance of petroleum products to one in which they are scarce and expensive may be a severe one. Ise suggests, therefore, the need for pilot plants to test out over a long period of time means of obtaining shale oil efficiently.[8] He calls attention to the fact that some $3,000,000,000 of investment in retorts and refineries would be needed to produce 400,000,000 barrels of oil a year from shale. Even such volume would be but a fraction of our present consumption. Experimentation with smaller plants that may be the precursor of so great an industry could easily save society much later travail.

Along with investment could well go a process of investment by repurchase of oil shale lands that a prodigal government allowed to be alienated long ago. Competitive capitalism has not proven too effective in conservation and government ownership of the bulk of these oil shale lands would probably be the best insurance for an orderly economical exploitation of them.

[8] United States oil policy. Yale University Press. 1926, p. 431.

As for investment looking to the conservation of soil, techniques are already being built up and a functioning arm of government already is in existence. The Forest Service has been functioning for a half century but has not yet formulated a comprehensive program for forest restoration that has fired the nation's imagination and enthusiasm. Perhaps its long existence as a bureau has given its established program too high a status and provided a temptation to protect existing structures when new ones are actually needed.

Yet the restoration to productiveness of broad acreages of forest land in the country could be an excellent conservation measure. Forest production makes virtually no draft upon exhaustible resources but draws rather upon the inexhaustible categories of moisture, carbon dioxide and sunlight. Future society should look to a lavish use of timber products since forest production can be carried on with so little draft on scarce resources.

If a comprehensive program of forest restoration is to be inaugurated a large amount of private or public investment will be needed. For many reasons private investment in forestry will be only a weak thing unless particularly favorable types of forest credit are made available.[9] Unless private investment can be stimulated by some governmental forest credit institution the only alternative is public investment. Many believe, indeed, that public investment alone is the feasible method. Parenthetically it is worth noting that such investment will have many valuable subsidiary effects. That is, forest communities have persistently been drained of their wealth till both land and people have become impoverished. A broad conservation program will help reverse the flow of investment and will permit the rebuilding of the entire forest community. Such a program could probably use several billion dollars of investment funds if its objective were to restore the forests and the forest communities of the country to a level of productive efficiency that is common in Europe.

The Machinery of Conservation

Any agency established to provide governmental credit for forestry could be counted part of the needed public machinery to

[9] The author has discussed this matter in a number of articles: Economics of forest restoration in the United States, Scientific Agriculture, March 1941; Providing credit for forest restoration, American forests, 45: 310–312, 1938—with A. H. Mussman; Interest and credit costs in forest restoration, Journal of Forestry, February, 1940; The balancing of private and public interests in a forest restoration program, Hearings before Joint Committee on Forestry of the United States, December 1939, Madison, Wis.

effectuate conservation policy. Much additional administrative machinery would be needed, however, and perhaps, if society is to cope effectively with its conservation problems a full department as carefully functionalized as the present Department of Agriculture will be needed. The pressing need for a Department of the Interior is, of course, past. The name of the Department no longer means much and the creation of a new Department might, for many reasons, be strategic.

A first task of such a Department would be to determine and thereafter to establish, as best it could, a balanced conservation policy and program. Many agencies of the presently constituted Departments should probably be transferred to such a new Department. Indeed, it is difficult to understand how an even handed policy of conservation can be achieved if conservation activities are to remain scattered as they are at present. Furthermore, under present circumstances no agency concerns itself deeply with resource reserves, and with such broad matters as substitutability, restorability, and recoverability and likewise, no agency makes the needed continuous study of rates of exploitation and consumption which are after all the backbone of conservation policy. Because of too little attention to such matters in the past, the nation remained too long ignorant of the depletion of its forests, awoke only at a late date to the depletion of its soil and does not even yet take seriously the problem of oil and mineral depletion and so on.

Likewise no arm of government as now constituted is charged with determining when the policy of conservation should be restrictive and when expansive or developmental. As a result the nation's conservation policy becomes too much a matter of propaganda with an overemphasis upon precautionary policy supported by a persistent pointing to horrible examples of past misuse and a tendency to dwell at great length on the economics of past mistakes.

There would be, of course, innumerable ways of using such a department in a very practical manner. During the great depression of the 1930's millions if not billions of man days of labor were lost or spent boondoggling because the nation did not have a work budget prepared to make effective use of them. After the present defense effort there will be a great problem of demobilization, the effects of which could be softened if the government were prepared in advance to offer the released men needed, even if only temporary, work of a conservation nature. Fortunately, almost every little community could provide some opportunities to use work of this

kind so that projects would be as widespread as the potential or actual unemployment.

After it is well established such an agency or department would be quite as useful during a war as during a depression. In both instances, indeed, the problems are not dissimilar. That is, both call for the shifting of labor and of equipment to other than normal peacetime fronts. A vast archive of facts about the amounts and location of reserves, about rates of exploitation that are feasible, together with other information on substitutes and recoverability could be of immense strategic importance. One has only to read the recent book by Mr. Baruch on American Industry at War to obtain an idea of how useful during an emergency period a Department of Conservation could be.

A further continuing function of such an agency would be the understanding and curbing of waste. Waste is a major enemy of conservation but not every indication of waste can be taken as establishing the fact. That is, some resource waste are technically unavoidable. Some wastes occur because of ignorance of how to prevent them. Some apparent wastes could be avoided only by a lavish use of human effort or of other resources and are, therefore, not wastes at all. Sometimes also wastes are more apparent than real because of marketing difficulties. Nevertheless, real problems of waste do exist and at present society is only poorly organized to understand and to cope with them.

Quite as tough a problem will be presented by the attempt to understand the relationship of technology to conservation and to formulate suitable policies. Technological advances that open up new energy sources for instance have a double meaning for the conservationist. Energy in general is a substitute for resources in general but newly available energy sources may also permit an even more rapid rate of exploitation of resources the reserves of which are low. Judging the net effect and gauging policies in such circumstances will be a delicate matter. Not all technological advances will present such delicate problems, however. Many will aid restoration, improve recoverability, or facilitate the resort to lower grade or inexhaustible resources and, as such, will be wholly favorable from a conservation standpoint.

Finally, the work of the conservation agency would be one of long range planning closely similar certainly to the work of the present National Resources Planning Board but oriented differ-

ently. Furthermore, with a judicious system of federal aids in vogue, the work of the agency could and would be quickly integrated with that of the many state Departments of Conservation upon which it could be expected to exert a powerful influence.

The Budget for Conservation

The budget for the conservation program of the future may and probably will be large. The funds so used, however, would constitute an investment purposely designed to increase and fortify all types of production and, for that reason, national income. Even administrative and research funds used for the conservation program would contribute to such a result. The limit in the amount of funds that could effectively be used for these purposes would be determined by the efficiency of the marginal uses to which the funds were devoted and the cost in implicit or explicit interest to society or the public.

These are only general matters, however, and the factors that will govern the size of the conservation budget are far more tangible. To begin with, as the national income increases and the impact of exploitation on resources is stepped up the need for increased outlays on conservation will be correspondingly enlarged if the full efficiency of the resources in general is to be maintained. Fortunately, as national income grows the ability of society to devote larger funds to conservation grows as well. That is, there must be a principle governing the outlay of society's income much like that governing the expenditures of individuals. Outlays of individuals for improvement, savings and investment await on the whole, the provision of a sufficiency of food, clothes, and shelter but grow disproportionately rapidly with each increment of additional income thereafter.

First order wants for food, clothing, and shelter in the United States are relatively well provided now and if our society can use say $3,000,000,000 for conservation in all its phases when national income is at a $100,000,000,000 level the amount so employed when income reaches 250 to 300 billion dollars which Hansen[10] projects for the country in 50 years, could easily be $25,000,000,000 a year.

For another and perhaps equally important reason, furthermore, the budget may be made very large. Interest rates in recent years have fallen markedly. They may rise somewhat during the defense

[10] See page 173, Fiscal policy and business cycles. Norton & Co., 1941.

effort and during the period of the rebuilding of Europe after the war. Many believe, however, that such rates have settled to a much lower norm than formerly.[11] If that is true investments may be extended into areas and used for purposes that could not have been considered in preceding decades. Expenditures and investments for conservation in the past have undoubtedly been small because there have been so many other types of outlays that promised a greater return.

Will the future, the lower prospective interest rates considered, witness the development of a far different situation? There are indeed reasons to look for quite a different investment situation from now on. First the industrialization and urbanization of the country is now at an advanced stage and will probably require less new investment than formerly. Yet with national income mounting the investment fund almost certainly will continue very large. Indeed, funds available for investment may increase absolutely even if a rising propensity to consume cuts down the proportion of income that is saved in the future.

Society will face the necessity to find employment for these savings if they are not to be wasted and the matter may be one of considerable difficulty. Hansen states, "The fact is that it requires an extraordinary readjustment of customs, habits, and behavior patterns to change from a society which has practiced a high ratio of saving to income to one in which a *high* ratio of consumption to income is called for."[12] Investment in many forms of conservation as visualized herein will be fairly neutral as far as the clash between business and vested interests and government is concerned and can be used to make the readjustment to which Hansen refers somewhat less difficult than it would otherwise be.

Furthermore, conservation investment could be made to mean a great deal for rural living. Almost certainly rural investment has been badly overlooked in the United States in favor of the rapid upbuilding of the nation's cities and industries. Hansen is almost certainly wrong in his statement that investment concentrated on the western frontier if he included in this frontier the rural community which was its major characteristic. He states "What pro-

[11] Perhaps it is worth noting in this connection that the State of Missouri recently sold a small issue of road bonds maturing in 1953 at a net yield of 1.25 per cent.

[12] Fiscal policy and business cycles. See p. 408. Through an error the word "low" is used in the book where the word "high" should have been used.

portion of new capital formation in the United States went each year to the Western frontier we do not know, but it must have been considerable."[13] Only in a very general sense can this statement be at all true since any adequate consideration of the history of capital formation in the United States could substantiate no other conclusion than that the western frontier was persistently starved for capital and that investment has persistently been greatest in the area east of the Mississippi and north of the Ohio where the process of industrialization and urbanization has been most rapid.

Indeed, no one traveling over the general rural or countryside areas of the United States can help but be struck by their comparative underdevelopment in relation to the urban centers. The fact that the cities and industries of the country have been built in the short space of three centuries is a remarkable accomplishment. To the extent that this accomplishment has been at the expense of the depletion of soil, forests, and wild life, wasteful exploitation of minerals, coal, petroleum and gas, and an even more careless concern for soil and water resources, it is built upon a foundation that cannot last. Expenditures upon and investment in conservation should, therefore, give society a far better balanced economy. At the same time, since so much of conservation investment must be rural investment, it will rejuvenate many blighted rural areas that a too intense concentration on the rapid upbuilding of an industrial and urban economy has given us. That is, as a concluding matter, society would find that an adequately financed conservation program would permit and facilitate the prosecution of a number of social policies that a laissez-faire economy has disregarded.

[13] Ibid., p. 360.

PROBLEMS IN PHYSICAL EVALUATION OF SOIL CONSERVATION BENEFITS

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IN CONSIDERING the physical evaluation of soil conservation benefits, I propose to discuss the relation between physical and economic evaluation, the importance of physical factors in the evaluation process (including the lack of consideration of physical factors in past evaluations), some problems in the interpretation of physical data now available, the need for further data, and the joint nature of the responsibility for performing the job of evaluating soil conservation benefits.

Relation Between Physical and Economic Evaluation

The segregation of physical and economic factors that must be considered in an evaluation of conservation benefits is necessarily an arbitrary one. Physical relationships are of little importance if they have no economic application, and a major portion of economic interpretation consists of the appraisal of physical relationships. Both kinds of factors must be considered concurrently. The economic interpretation of the major physical background determines in large part, the kinds of minor physical relationships concerning which information is necessary in order to make further economic interpretation. Information concerning physical factors is not something which can be separately accumulated, wrapped and mailed to the economic laboratory for interpretation. It may be unnecessary to explore the full array of physical relationships in a given situation if their influence on the problem at hand is such that only a part of them conceivably could be involved in the analysis. For instance, soil adaptation to irrigation or to the growing of specific truck crops would be unnecessary physical information, if for reasons of a lack of water supply, transportation, markets or other conditions, such land use would not be feasible.

What are these soil conservation benefits we are trying to evaluate? Are we trying to save the last ounce of soil and the last drop of water, and if so, for what purpose?

The goal of conservation of soil and water resources is to achieve better land use and relatively permanent systems of farming, to provide a better life for people living on the land, and to insure protection of public welfare. In November, 1939, Henry A. Wallace,

then Secretary of Agriculture, said: "Damage to the land is important only because it damages the lives of people and threatens the general welfare. Saving soil and forests and water is not an end in itself; it is only a means to the end of better living and greater security for men and women."[1] The soil conservation benefits that we are trying to evaluate are those effects of desirable physical adjustments in land use and cropping practices, consistent with the use of labor, capital and other resources of the farmer, on the production of food, feed, fiber and forest products over a period of time.

Importance of Physical Factors

Even though the physical and economic aspects of the subject are very closely joined, it should not be impossible to divide the emphasis on physical and economic factors in evaluating soil conservation costs and benefits.

One reason that physical factors should be given first consideration is that economic interpretations are so utterly dependent on production adaptations to soil, slope, and climatic conditions of temperature and precipitation. Some of these, such as soil type, and slope, may be examined in place, while the climatic conditions are highly variable from season to season and from year to year, and thus must be examined over a period of years. The range of production possibilities, however, is dependent on these physical factors.

Many economic ills have befallen us because of mistaken judgments as to production possibilities of specified land resources. Farm sizes and community development of roads and schools have become adjusted to these mistaken judgments, and have left a whole series of readjustment obstacles in their wake. Settlement during temporarily favorable climatic conditions illustrates the error in judgment in some instances. A more important error in judgment, however, and one with wider application, is the failure to recognize soil losses by erosion and to appreciate their effect on future production. Gullies are spectacular but the greater losses due to sheet erosion receive scant notice.

Use Capability of Land

We must recognize that parcels of land vary in their suitability to specific uses for agricultural purposes. A concept of land capabil-

[1] H. A. Wallace, Conservation—the farmers' part in national defense. Address . . . at the annual meeting of the Association of Land Grant Colleges and Universities at Washington, D. C. Nov. 17, 1939. 23 pp. mimeo.

ity is important in trying to evaluate the economic effects of adjusting present farming methods to the physical capacity of the land for continuous use. Use capability may be defined as the suitability for safe use without erosion or other deterioration, for an indefinite period. Classes according to use capability are chosen to permit definition of the maximum intensity of use associated with the minimum intensity of appropriate conservation practices which will maintain the productive capacity of the soil. Each class has a ceiling of use possibilities based on a concept of maintenance of soil resources.

The classification of land according to use capabilities as used by the Soil Conservation Service involves a grouping of the factors considered in the soil conservation survey. Physical features of soil type, slope, and present degree of erosion, along with climatic conditions of temperature, precipitation and wind movement, adaptation of crop combinations to this physical environment, and the use of essential cropping practices, are considered in setting up the broad categories of use limitations. Three land classes (I, II and III) indicate land that can be recommended for cultivation. One other class (IV) is suitable for limited use for cultivated crops. The lands classified as V, VI and VII are not suitable for cultivation but are adapted to a permanent protective cover of grass or trees. Class VIII land is not suitable for cultivation, grazing or forestry.

Class I land is that which is suitable for cultivation without special practices, class II land is that requiring simple, erosion-control or management practices, and class III land is that which safely can be cultivated only with intensive practices. The specific grouping of physical features and alternative cropping practices appropriate to each land capability class are determined to fit the local situation.

Below these ceilings of use capabilities in each class of land exists the possibility of many combinations of land use and cropping practices, the feasibility of which will depend on economic considerations. Wide latitude usually remains for the choice of individual farm organizations. Reduced intensity of land use with respect to cultivated crops is ordinarily accompanied by less intensive cropping practices. Thus on a specific farm a specified proportion of intertilled crops, small grain and grasses might be grown if the land were terraced and the fields were laid out in contour strips, while if a smaller proportion of intertilled crops and more grasses and le-

gumes were included in the rotation, the terracing might not be necessary.

Farmers need more information as to where these ceilings are for a given physical situation. Too many farmers use the same cropping system on the entire farm although the character of land resources may vary widely. Individual farmers on steep, shallow or wet land tend to use the same methods that their neighbors use on better land. Among other reasons, this is due to the failure to recognize the capabilities and limitations of the land on which they walk and work and live.

Consideration of Land Capabilities by Agricultural Workers

Farmers have not been alone in their failure to recognize or to utilize in the cropping program the differences in land capacity. Agricultural workers oftentimes have made recommendations to farmers without adequate consideration of their land resources. The recommendations for growing specific crops such as alfalfa, soybeans or potatoes, or for raising specific kinds of livestock such as hogs, dairy cattle, or beef cattle, or for a farm layout in rectangular fields, have not given sufficient attention to how these recommendations would fit together in the farm organization, or how they would be adapted to the kinds of land resources on farms in the community.

Many economic researchers have not considered land characteristics as a variable, but have compiled yield indexes and proportions of land in specific crops as though the land were uniform throughout the area studied. Although the farms in some areas are very nearly uniform in land characteristics, the proportion of such areas is small, and variation not uniformity, is the rule. Especially in the evaluation of a conservation program in an area, the analysis should consider the differences in land capabilities because both the nature and economic effects of such a program ordinarily are very closely associated with the relationships between present use and the capability of the land. Such consideration will affect the grouping of farms for analysis, the kind of conservation program to be evaluated, and its economic effects.

Land use capability considerations give us a base point from which to measure the incidence and effects of a conservation program. Steep slopes and eroded areas do not produce average yields even though this assumption is implicit in many of the current

economic evaluations of conservation programs. The utilization of present data and the acquisition of more information concerning crop yields on farms, by soil type, slope and erosion classes, are essential elements in the evaluation of physical aspects of the problem. Accurate measuring instruments are of little avail if we do not have a base point from which to start measurement.

Measurement of Soil Losses

Of what value is it to know how much soil has been lost? The results of experiments in which the quantitative losses of soil and water by erosion and runoff have been measured, are useful for two purposes. They help to establish the relationship between physical factors which induce erosion, and they aid in measuring the effectiveness of vegetative and mechanical means of reducing soil and water losses. A knowledge of the extent of soil losses associated with present farming methods is helpful in evaluating the importance of doing something about them. The relationships of soil type, vegetal cover, contour tillage, and soil treatments, to the extent of soil and water losses, give a basis for determining the recommended methods of erosion control.

The ten conservation experiment stations established in 1929 now have considerable data bearing on the rate of soil loss. At Bethany, Missouri, from 1931 to 1935 on an 8 per cent slope of Shelby silt loam, a continuous corn plot lost 69 tons of soil per acre annually, a plot rotated with corn, wheat and clover lost 11 tons per acre per year, while the plots of continuous alfalfa and continuous grass lost only a fraction of one ton. Water losses by runoff from the three sets of plots were 28 per cent, 15 per cent, and 8 per cent respectively. Similar information is available for many other soil types, slopes, land uses and amounts of precipitation.[2]

Soil losses usually become accelerated as the surface soil is removed. At Tyler, Texas, continuous cotton (fertilized) on normal surface soil lost 30 tons per acre per year as compared with 68 tons

[2] Such as Marshall silt loam on a 9 per cent slope with 27 inches of precipitation at Clarinda, Iowa, Clinton silt loam on a 16 per cent slope with 34 inches of precipitation at LaCrosse, Wisconsin, Colby silty clay loam on a 5 per cent slope and a 20-inch rainfall at Hays, Kansas, Kirvin fine sandy loam on a 9 per cent slope at Tyler, Texas, with 42 inches of rain, Vernon fine sandy loam on an 8 per cent slope at Guthrie, Oklahoma with 33 inches of rain, Cecil sandy clay loam on a 10 per cent slope at Statesville North Carolina, with 48 inches of rainfall, Muskingum silt loam on a 12 per cent slope at Zanesville, Ohio, Houston black clay on a 4 per cent slope and 33 inches of rain at Temple, Texas, and Palouse silt loam on a 30 per cent slope at Pullman, Washington.

lost in subsoil with the same treatment. At Guthrie, Oklahoma, continuous cotton plots of surface soil lost 24 tons of soil per acre per year compared with 34 tons per acre per year of subsoil with the same slope. Likewise, at Zanesville, Ohio, on 12 per cent slope, continuous corn plots on surface soil lost 73 tons per acre per year as compared with 93 tons on desurfaced plots.

It is a commonplace fact that soil loss almost generally varies directly with per cent of slope, if other conditions are similar. Thus (on 72 foot slopes) at Temple, Texas, four year results show that corn plots lost 11 tons of soil per acre per year on a 2 per cent slope as compared with 30 tons on a 4 per cent slope. At Tyler, Texas, cotton on a 9 per cent slope lost 28 tons per acre per year as compared with 72 tons on a 16 per cent slope on the same soil type. On Shelby loam in Missouri, more than three times as much soil was lost per acre annually from a corn plot of 8 per cent slope as on one which was less than one-half as steep.

Soil losses usually vary directly with length of slope also, in spite of increased deposition above the foot of the slope. The relationship between per cent of runoff and length of slope, however, is not so nearly general, and is sometimes reversed because of the greater opportunity for increased infiltration.

Organic matter in the soil has important effects on the rate of soil erosion and water runoff. It improves the structural condition of the soil, increases the infiltration capacity, and by favoring the growth of beneficial microorganisms and the availability of plant nutrients, aids in stimulating vegetal growth, which reduces the rate of soil erosion both by the greater binding effect of a more vigorous root system and by the greater protection of an increased vegetative canopy. The presence of organic matter probably is a large factor in explaining the difference in erosion rates on normal and eroded soils. Thus on 12 important agricultural soils, the average organic matter content of uneroded soils was 4.3 per cent as compared with 1.0 per cent organic matter in eroded soils of the same type.[3]

Organic matter also has a large part in the reduced rate of soil loss accompanying the growing of intertilled crops in rotation with legumes in comparison with a succession of intertilled crops. At Guthrie, Oklahoma, the rotation plots of cotton, wheat and sweet-

[3] H. H. Bennett, Soil conservation. New York and London, McGraw-Hill, 1939. p. 993 and p. 221.

clover lost 14 tons of soil per acre per year on the cotton plots as compared with 24 tons per year on continuous cotton plots. At LaCrosse, Wisconsin, on a 16 per cent slope, corn in rotation lost 54 tons of soil per acre per year as compared with 88 tons on the continuous corn plot.

Mechanical measures also have important effects on the rate of soil and moisture losses. On Houston black clay at Temple, Texas, the contour cultivation of continuous cotton reduced soil losses from 28 tons to 17 tons per acre per year. In a rotation of corn, oats, and cotton at the same station, contour cultivation reduced soil losses from 13 tons to 6 tons per acre per year. A reduced rate of run-off and increased opportunity for infiltration are the principal factors acting to reduce soil losses in contour tillage operations.

Terraces constructed across a slope intercept and divert run-off before it gains sufficient volume and velocity to erode the soil. They are particularly useful on highly erodible soils with long slopes, where high rainfall intensities prevail, and where a large proportion of erosion permitting crops are used in the rotation. The use of terraces of proper specifications to fit the rainfall pattern and physical features of the land forces excess water to "walk" rather than run off the land particularly when they are supplemented by proper agronomic practices and other soil conserving measures. Most terraces conserve both soil and moisture although in the humid areas regulated surface drainage to prevent soil loss is the principal objective while in areas of lesser rainfall, increased absorption or moisture conservation is of primary importance.

Influence of Soil Conserving Methods on Yields per Acre

A primary need in the evaluation of soil conservation benefits is to know the effects of a combination of soil conserving practices and land uses on yield per acre in a specified combination of physical circumstances. These yield effects may be of several kinds. Probably the most common one is the obviation of a decline in yield that would otherwise take place with continued soil erosion. In many areas yield increases accompany the use of soil amendments which are necessary for adequate vegetal cover. The conservation of moisture through contour operations results in increased yields in areas where moisture is a limiting factor. On some farms the influence of increased yields due to some factors offsets decreases due to other factors.

Average yields of specific crops for the farm as a whole vary also with the differences in kinds of land on which the crops are grown. If steep, eroded land is retired from cultivated crops the average yield per acre of cultivated crops for the farm would be increased even though the actual yield of the remaining acreage were the same as formerly. If this same acreage were used for pasture, a smaller yield of pasturage per acre might be obtained than on some bottomland pasture previously used, especially if there were no difference in treatment. This statement would seem to be perfectly obvious, yet its significance has not been observed in many studies evaluating conservation benefits.

The yield effect that is most difficult to measure probably is the one that occurs most commonly, namely, the obviated decline in yield due to loss of surface soil that would otherwise occur. Probably on account of this difficulty many studies have described it qualitatively but have not given it quantitative expression. Where an evaluation is being made in quantitative terms, the omission of this factor is a serious one.

Yields of corn, oats, cotton, and wheat on subsoil ranged from 31 per cent to 63 per cent of the yields of the same crops grown on topsoil under otherwise similar conditions on the principal soil types at ten soil and water conservation experiment stations.[4] At Tyler, Texas, fertilized cotton on subsoil yielded only 56 per cent as much as unfertilized cotton on topsoil.

As aptly stated by F. L. Duley of the University of Missouri,[5] "Most of the worn-out lands of the world are in their present condition because much of the surface soil has washed away, and not because they have been worn out by cropping. Productive soils can be maintained through centuries of farming if serious erosion is prevented." The rate of plant-food removal by erosion has been estimated to be many times greater than the rate of removal by agricultural crops.

This effect of progressive erosion on yield per acre cannot be measured by yield trends for the country as a whole, or even for a region or county, unless the effects of many other factors affecting yields can be evaluated also. Shifting crops from less to more productive land explains the apparently sustained yield trends in some

[4] H. H. Bennett, Soil conservation. New York and London, McGraw-Hill, 1939. p. 993 and p. 216.

[5] F. L. Duley, Controlling surface erosion of farm lands. Missouri Agr. Expt. Sta. bull. 211. 23 pp., illus. Columbia, Mo., April 1924, p. 1.

regions where the area of eroded land obviously has increased. The drainage, clearing, and breaking of new lands has made possible the maintenance or even increase in yield per acre and total production in the face of increased abandonment of former crop land.

Improved cultural techniques such as the improvement in strains and varieties of crops, better crop rotations, increased use of fertilizer, increased use of farm machinery and mechanical power of improved design have aided greatly in the maintenance of yield per acre. Yields should have increased much more than they have. Salter, Lewis and Slipher[6] said it this way—"all of these changes and improvements should have raised acre yields considerably, . . . we believe an increase of 40 to 60 per cent would have been conservative. There can be but one explanation for the stubbornness with which acre yields have resisted the farmer's efforts to improve them. The natural productive capacity of the land has been deteriorating at a rate almost fast enough to offset all of these improvements in soil and crop management. With every step ahead we have slipped back almost if not quite so far."

A decline in yield and production of one per cent per year over a twenty-five year period is very significant, but in any one year or even in five years its influence is apt to be lost among the many other variables affecting production. For this reason, the relative yield trends on farms using and not using soil-conserving methods have not proven to be a very fruitful source of evidence in this connection. It may be more useful to adapt information from studies in which the effect of some of these variables have been eliminated than to depend on gross comparisons. Yield determinations by slope and erosion classes on individual farms where management would not be a variable may give more dependable answers than to compare yields and production on entire farms, where not only management but soil type, slope percentage, and degree of erosion also are incidental variables.

A study in the Black Prairie area in Texas[7] indicates that the farms in "Erosion Class 3" had cotton yields 20 per cent lower and

[6] R. M. Salter, R. D. Lewis, and J. A. Slipher, Our heritage—the soil. Ohio State University, Ext. Service Bull. 175. 20 pp., illus. Columbus, Ohio, April 1936. p. 5.

[7] Texas Agricultural Experiment Station. Division of farm and ranch economics. Farm business report, Elm Creek watershed, Black Prairie area, Texas, 1933 (preliminary) by B. H. Thibodeaux, C. H. Bates, and C. A. Bonnen. College Station, Texas, Division of farm and ranch economics, Texas A. & M. College, April 1937. 25 pp., mimeo.

corn yields 12 per cent lower than the farms in "Erosion Class 1." The average yield index for all crops was 16 per cent lower on the most eroded farms than on those farms with least erosion. It may be that we should depend on evidence similar to this to establish the relationships between yield and differences in degree of erosion, and depend on experimental data for information concerning rates of soil loss as associated with land uses and cropping practices.

Problems in Obtaining Basic Physical Data

The availability of adequate data is an ever present problem. Many of our experimental results have been tabulated and analyzed without thought of relating them to the conservation aspects of the problem. The lack of essential items makes it impossible to go back now to discover these relationships from such data. Many experiments were planned so that conservation aspects would not be a variable rather than being designed to measure them.

Measuring Pasture Yields

Another problem of evaluating physical relationships is the difficulty of measuring pasture yields previous to its utilization by livestock, the possibility of which is so convenient in the case of harvested crops. The weighing and analysis of clippings from sample plots do not reflect perfectly the results from grazing. The necessity to use livestock production comparisons as a measure of pasture yields complicates the problem considerably. Pasture utilization has several measurement problems of its own. Since more than one-half of the feed nutrients consumed by grazing livestock are ordinarily required for maintenance, a difference in rate of stocking which results in a difference in pasturage consumed per head might result in higher livestock production from the lower yielding pasture. The utilization of an acre of pasture yielding 1,000 units of feed by one head of livestock requiring 600 units of feed for maintenance might result in 400 units of livestock production, while another acre of pasture yielding 2,000 units of feed, if utilized by three head of livestock requiring 1,800 units of maintenance would be credited with only 200 units of livestock production. The interpretation of differences in production of livestock products and differences in gain or loss of weight of animals of varying ages and classes of growing and breeding stock is a major difficulty.

Accurate measurements of pasture production would be of little

avail if they were nullified by improper or impractical methods of pasture utilization. Stocking the pasture too heavily might result in low livestock production because the quantity of nutrients obtained per head of livestock was only slightly above maintenance requirements. If stocked too lightly, the livestock might have maximum production per head but a larger proportion of the pasturage would not be utilized in its most palatable stage or at all.

On account of the variation in pasture growth during the grazing season, good utilization from the standpoint of the livestock in many parts of the humid area, dictates considerable variation in the rate of stocking, provision of supplemental pastures for part of the grazing season, or supplemental feeding of harvested feeds. A high proportion of the livestock in the country produces only one-half as much per head per day during a part of the grazing season, because pasturage per head has shrunk by one-fourth. A pasture day must be defined as a quantity of feed rather than a period of time spent in search of grass.

Attempts have been made to measure the quantity of nutrients obtained from pasture by deducting the nutrients in supplemental feed from the total requirements for maintenance and production of livestock. Thus in Purdue University Bulletin 454, F. V. Smith has calculated a utilization of 792 pounds of digestible nutrients per acre of permanent pasture, 1,273 pounds per acre of rotation pasture and 652 pounds per acre of aftermath, with variations of more than 300 per cent by soil types. I will leave for Mr. Johnson the economic interpretation of how this information concerning pasture yields and its utilization in the production of livestock products affect the farm organization.

Difficulty of Interpreting Multiple Effects

Still another problem is the difficulty of interpretation of results caused by multiple influences. Even in so-called controlled experiments, a whole bundle of inter-acting influences conspire to bring about a specific result. The extent of influence of individual factors may vary from year to year and from one season to another within the year. At Bethany, Missouri in 1935, an oats plot lost 36 tons of soil per acre, or more than 10 times the usual expectation, because of a rare series of intense rains on a saturated soil during the period just following seeding before sufficient vegetal growth for soil protection had been established. The interpretation of short-time results in the light of the expected frequencies and intensities of pre-

cipitation over a longer period is a necessary step in physical evaluation.

Seasonal variations also have a high degree of significance in physical interpretations. A high proportion of the erosion losses are caused by a rather small proportion of the total rains. At Zanesville, Ohio, 80 per cent of the soil loss on a corn plot in one year was occasioned by 5 per cent of the rains. The yearly soil loss must be broken down by seasons, and intensities of individual rains, as well as being related to vegetal cover, cropping practices, and mechanical control measures.

The combined effects of changes in cropping practices may change the incidence of prime physical factors so that diverse and oftentimes unforeseen results are obtained. The application of either lime or phosphate individually might have little effect on yield, if the other happened to be the limiting factor. Corn yield on a given field might be limited by the supply of mineral elements at one time of year, and by the moisture supply at another. Correcting the mineral deficiency would set up a new relationship between yield and available moisture. The application of mineral elements might aid the growth of sod-forming legumes so that organic matter and moisture-holding capacity of the soil were increased. Under these conditions the succeeding corn crop might be considerably increased except in extremely dry seasons when the higher ratio of moisture requirements to the available moisture might cause grain yields to suffer more than on some untreated field.

The conservation evaluation task involves the adaptation of observed relationships in one combination of circumstances to situations with a different proportion of incidental factors. The limitation of observations to the historical recording of results with a given set of circumstances does not utilize the opportunity to give much wider application to the information obtained. After finding out the constituent elements of the conservation problem we should set up specifications for improved farm conservation plans whether they be designed for the poultryman or dairy farmer in Ohio, or for the rancher or wheat grower in Texas.

Much Basic Information Available Now

The need for more and more information should not put us in the frame of mind that none is available now. Many economic studies seemingly have been construed as original explorations of the factors at work in the organization and operation of farms in an

area. Because farm operation conditions are recognizably different from those at the field experiment station, the results obtained at the latter are oftentimes not integrated and adapted to farm situations. A pressing need of farm management research is the adaptation of experimental results not only to the organization of enterprises on the farm with identical physical conditions, but also to farm situations with physical conditions slightly different from those of the experiment.

Much experimental data is available and useful in this evaluation of physical aspects. The greatest need is for a keen appreciation of the factors at work in bringing about a given experimental result so that the right choice of experimental data can be brought to bear on a farm situation with a different combination of incidental factors. If a specified feeding experiment with Guernsey cattle had been concluded, it would probably not be considered necessary to repeat the identical experiment with Jerseys. Other experimental data probably would be considered adequate to interpret the results for the two breeds.

In addition to reconnaissance conservation surveys and detailed county soil maps on 650 million acres, detailed soil conservation surveys have been made for almost 100 million acres of land. The cooperation of the United States Department of Agriculture with 642 soil conservation districts comprising 377 million acres organized as of November 15, 1941, will make it possible to obtain information concerning the physical features and land capabilities on additional farms in these areas.

The conservation experiment stations now have more than 10 years of data relating to quantitative soil losses by land use, soil treatments, mechanical cropping practices, soil type, slope and other factors. State experiment stations have yield information by varieties, crop rotations and soil amendments. A recent report[8] of an infiltration study under Texas range conditions shows that properly grazed range land absorbed approximately 1.8 inches of moisture in the first 60 minutes, with a constant minimum of 1.2 inches per hour during the second 60 minutes, while on overgrazed range the infiltration rate dropped to 0.15 inch per hour within 20 minutes.

Factual data are available concerning the effect of moisture conservation by contouring and level terracing on yields of cotton,

[8] G. W. Musgrave, and A. L. Sharp, Land use and infiltration, Technical bulletin of U.S.D.A. in process of publication. Figs. 9 and 10.

wheat, beans and grain sorghum in the Southern Great Plains.[9] Even in the humid area, moisture conservation brought about by contour farming operations has resulted in yield increases although in a lesser proportion of years than in the Great Plains. In the Corn Belt, measured results of corn yield by depth of surface soil gave useful indications for physical evaluation of conservation measures.

The important thing is to look at the combination of physical and economic factors in the farm organization, and then to see what experimental data will apply to it. The production data from the use of crop rotations on deep, level land at the experiment station obviously would not apply to steep eroded lands even if they were only 20 miles away and every other factor were identical. Some experimental results would apply over a radius of a thousand miles with wide variations in soil type and precipitation (e.g. feeding experiments). Other results might vary with soil type but be only slightly affected by differences in rainfall. Seasonal precipitation might be the limiting factor rather than the total for the year. Soil type sub-factors, such as organic matter content and lime or phosphate deficiencies might be the limiting ones which determine the nature of experimental results. The need for more or less moisture as a limiting factor is widely recognized, although we wish mostly for some change in the rainfall pattern rather than to bestir ourselves to conserve what we get or prepare to handle what we can fully expect either this year or next.

Joint Responsibilities for Evaluation

The evaluation of soil conservation benefits will require the combined efforts of the economist and the physical scientist. Many things that are physically possible may not be economically feasible, because of the relative demand for specific farm products or limitations on the use of labor, power and equipment. Likewise, the economic possibilities of changes in farm organization and operation are dependent on physical relationships and potentialities.

Aside from determining the relationships of prime physical factors, the physical scientist should strive to make his measurements at a point somewhat nearer to the point of application to farm conditions, and should attempt to lay down the limits of safe generalization from the specific conditions of the experiment.

The fact that 10 tons of manure per crop acre per year will have

[9] U. S. Soil Conservation Service. Better harvests through conservation farming. Washington, U. S. Govt. Print. Off., 1941. 10 pp.

specified effects on physical conditions of the soil and crop production is of little significance if the potential supply of manure on farms in the area is only one ton per acre per year. If experimental results apply to a specified soil type with 9 per cent slope, the physical scientist can help considerably in modifying the conclusions to apply to a 5 per cent slope.

This need to interpolate between physical guideposts will require the integration of different kinds of physical information, and the close cooperation of workers in the physical and social sciences. An example of this interpolating effort is reported by R. E. Uhland in Soil Conservation for December, 1939, in which he includes a table estimating the composite effects of per cent of slope, length of slope, degree of erosion, crop rotation, soil treatment, and mechanical control measures on the rate of soil loss, using several values for most of the factors.

Likewise, the economist cannot apply his economic yardstick in cloistered seclusion. He must be able to diagnose the physical symptoms so that he knows what kind of specialized information is required. He must become well-enough acquainted with the physical factors at work to know whether they are round, long, heavy or swift, and whether to use the calipers, scales, micrometer, or other kind of gauge.

No electric fences should separate the physical and economic fields of activity. Workers in each field must get across the border often enough and dig deep enough to know how to do their own job well when they get back. Soil inventory maps will be helpful in the diagnosis of physical symptoms. Further integration of physical relationships and interpolation between fixed points of experimental results will be very useful in devising suggested remedies. The latter is a joint responsibility because the economist in studying the organization of farms, usually locates the points of incidence, and the physical scientist can be very helpful in the choice and adaptation of experimental results to more nearly specific situations. The possibility of working together justifies the hope that we can use the information that is available now and acquire needed additional facts to evaluate the physical and economic benefits of soil conservation in terms of the organization of individual farms and in relation to the production patterns of the community, region and nation.

NEEDED DEVELOPMENTS IN THE EVALUATION OF SOIL CONSERVATION BENEFITS

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EARLY ATTEMPTS at evaluating conservation benefits on the farm were not particularly successful. The tools most commonly employed were the farm business survey and the farm account record, the approach exhibiting too great a dependence on average income differences to tell all we needed to know.

The job of record taking has frequently assumed major proportions in these approaches with too little time devoted to adequate analysis. Sometimes those who analyzed the records were not those who took them. This has some advantages in the use of better trained personnel on analytical phases but tends to divorce the analyst fron an intimate understanding of the problems with which he deals, the analysis tending to become too mechanical. In any event, complete dependence on the orthodox farm business survey or farm account record to provide the answers makes a roundabout chore of evaluation with results turning up as byproducts of a time and labor consuming process.

This is not intended as a condemnation of these tools nor a denial of the value they can have if used specifically for the task of evaluating conservation benefits. The source of most of our needed information is the farm, and the farm survey and account book contain many of the items required for adequate analysis. Their use as the source of valuable items of input-output information should be stressed, more emphasis being placed on forward looking analyses as opposed to that in retrospect. We need first to formulate a rather definite idea of the considerations on which evaluation can be based, supplementing the orthodox approaches where necessary and short-cutting them when possible to provide more definite guidance at an earlier date.[1] Perhaps we have considered the accumulation of farm survey and account book records too much as ends in themselves rather than as partial means for accomplishment of specific objectives.

[1] U.S.D.A. Miscellaneous Publication 463, A method of estimating the economic effects of planned conservation on an individual farm, by A. C. Bunce and George Collier, provides a good idea of the considerations needed. Comparison of these against the items obtained in the usual farm business survey or farm account record will indicate the degree to which supplemental information is necessary.

An early form of evaluation, and one that still persists, is based on observations between groups of farms replanned for conservation (the cooperators), and non-cooperating groups. For the most part, the factor of cooperation has been magnified beyond its true proportions. Even at the outset, cooperation failed to afford a clear-cut basis of comparison despite precautions taken to hold other variables constant. Signing on the dotted line does not immediately create a marked difference between one farmer and his neighbor; it is only over a period of time that the results of changes in organization and practice manifest themselves. Differences in physical conditions, managerial ability, types of farming, size of farms, tenure of operator, yearly fluctuations in prices and costs, etc., may be factors of equal or greater importance. Then too, differences between cooperators and non-cooperators tend to grow increasingly less as time passes. Some non-cooperators become cooperators, while others adopt the more promising practices without formal agreement with a sponsoring agency, or achieve partial conservation programs through the practice payments of the Agricultural Adjustment Administration.

The impact of all variables included in a producing unit is registered upon the farm income in greater or lesser degree. Attributing differences in income largely to the factor of cooperation can safely be done only when careful examination shows that all other major variables have remained reasonably constant. Even then the investigator will need to qualify his statements to an extent seldom encountered and his careful work is likely to be discounted because of the prevalence of less discriminating comparisons in this field.

What has been said is directed primarily at comparisons of average incomes between cooperating and non-cooperating groups. Some of the variables affecting income are eliminated when comparisons are placed on a physical basis, i.e. the difference in crop yields on treated and untreated fields, savings in labor and fuel from farming on the contour, etc., but even here the pitfalls are many and the services of the technician are needed to aid in placing the study on as scientific a basis as possible.

Studies of representative case farms over a period of years covering the "before and after" of adopting a soil conserving system of farming offer one of the more valid methods of comparison. Here even more of the troublesome variables are held constant since the farm and farmer remain the same during the period of study.

Sharpening the Focus by Grouping Farms

As of November 15 last, petitions had been accepted for nearly a thousand soil conservation districts, and 642 embracing 35 per cent of the Nation's land in farms were already established. While the bulk of these districts are found in the Southeast and South, they are scattered over 38 of the States and one is impressed with the tremendous diversity in type, size and physical condition of farms whose operators are giving thought to the kind of conservation program they can afford to adopt.

While the individual peculiarities of farms and farmers make each in a sense a law unto itself, the economist and farm planner should see some similarity between the physical, economic, and social situations on farms, some problems shared in common in attaining conservation goals. Only by segregating farms in groups that "speak the same language" can we become articulate and effective, with the task of evaluation reduced to a size with which we can really cope.[2]

A serious bottleneck in the grouping process has been the time and expense involved in determining the relative importance of various sorting factors in the universe of inquiry and the classification of farms into roughly homogeneous groups from which samples can be drawn for study. Preoccupation here has frequently resulted in slighting the analytical phases of subsequent work. Increasing emphasis on the need for better techniques in sorting and sampling farms is occurring at a time when the possibilities of doing an acceptable job are becoming somewhat more favorable. The 1942 Farm Production Plan of the Department, recently obtained by Agricultural Adjustment Administration committeemen from the great bulk of the Nation's farmers, contains many of the elements needed to provide an adequate picture of how individual farms are organized and operated in all sections of the country. Simple modifications of this form, if it is retaken annually could well make it of tremendous significance as a secondary source of information for sorting and sampling purposes.[3]

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[2] Neil W. Johnson, Conservation—an objective or an ideal?, JOUR. OF FARM ECON., vol. 23, November 1941, p. 829.

[3] These would involve a somewhat more complete enumeration of crops and livestock and a simple breakdown of land uses other than for crops on the farm. Hay and pasture acreages would need to be reported separately. In later years, when it is not necessary to give special emphasis to food for defense, a more simple arrangement of the form could be provided.

Having isolated the situations needing study these should be re-examined in an attempt to confine analyses to those on which the impact of a conservation program is clearly different. Setting up a few clearcut pictures in the reader's mind, we should credit him with the ability to interpolate from them for the intermediate situations. Regradless of the excellence of analysis, presentation of too many cases tends to confuse rather than to convince.[4]

The advantages in grouping farms for study are for the most part, obvious. Confining the analyses to farms representative of groups permits studying fewer farms more critically, at the same time preparing the results of research in a form readily adapted to group planning methods. The latter practice is assuming increasing importance with the expansion of conservation districts and pressure for economy in the administration of action programs. More satisfactory results are achieved by avoiding generalities and by telling a specific and recognizable story to the group who can make use of it. Furthermore, widespread adoption of the approach would lay the groundwork for building indicators of areal, regional, and national trends.

A related type of grouping on a broader basis holds considerable promise in evaluating conservation benefits. The majority of attempts at evaluation to date have been concerned with owner operated, commercialized farms. Farmers in this broad group, once convinced of the benefits in adopting conservation measures can, for the most part, afford moderate investments that may be needed, and some reduction in current income during the transition period. Some of our more erosive, less productive soils, however, are farmed by the low income farmer to whom conservation may present an almost unattainable ideal.

Another broad group is that represented by the tenant farmer whose conditions vary all the way from the uncertain, unenviable position of the southern sharecropper to the large scale exponent of soil exploitation.

Evaluation in terms of these broad classes should contribute to a better understanding of problems in financing conservation pro-

[4] See Robt. E. Graham, Jr., Improving low incomes on tobacco farms, Caswell County, North Carolina, joint publication of the Bureau of Agricultural Economics and the North Carolina Agricultural Experiment Station, processed by the U.S. D.A., June 1941, (F. M. 24). This study is notable for the way in which the problems of eight representative case farms are described leaving with the reader their relation to three major situations that stand out without confusion.

grams among the disadvantaged classes, to landlord-tenant relationships as they affect the soil, and to formulation and administration of the Nation's policies in conservation.

The Budget Approach as Applied to the Farm and the Group

The march of world events is hastening the day when farming systems in many sections of the country may need to undergo radical changes. These may range from greater intensification within the same farm type to development of enterprises with which the operator is largely unfamiliar. In either event there is grave danger that changes may be undertaken without realization of the consequences involved. The budget as a device permitting some idea of the probable effect of contemplated changes becomes increasingly important as a guide to individual farmers and to those administering agricultural programs and formulating agricultural policy.

Once the physical and social scientists learn to work together in providing tenable assumptions upon which budgets can be based the mechanics of the process itself offer no insurmountable difficulties. Budgeting work could be strengthened by frank presentation of the assumptions on prices, costs, and production that have been used. A good idea of the limitations of the data and the extent to which they can be generalized should be given. If experimental results are used, they should be discounted somewhat for application under farm conditions, making the probable effects as realistic as possible. Having acted upon the results of budgetary analyses, provision should be made for periodic checks of actual versus expected results. Only in this way can we come to an appreciation of the points of greatest weakness in the budgetary approach and correct for them. Perhaps the lack of confidence some careful research workers have in budgeting is due to our neglect to refine it as a scientific tool.

The development of national programs affecting agriculture has focused attention on the need for frequent evaluation of what is happening to farmers in the mass, on an areal, a regional and a national basis. Lacking means of totaling the changes occurring on individual farms, a common alternative is that of generalizing on the basis of budgets prepared for so-called representative, or typical farms. Recognizing the many differences that exist from farm to farm, even in what are termed homogeneous areas, we stand in need of careful research that will explore the strength and weakness

in this approach, making us aware of the necessary precautions in its use. Which of the many similarities and differences between farms must we take especial care to keep reasonably constant if generalizations based on typical farms are to be valid and which can be disregarded as having but small effect on the questions involved?

Considerations Within the Budgeting Framework

First consideration in obtaining a soil conserving system of farming is given to the changes in land use and cropping practices needed to achieve this end. Land use capability classes are being developed and employed on conservation districts in making this determination. These classes represent the best judgment of the technician on how the land should be used and how it should be treated when used in that manner. It involves reducing the technical knowledge that may be available on the soils of an area to a practical working basis for farmer use with, of course, special reference to safeguarding against soil and water loss.

The extent to which the classification is satisfactory from area to area is somewhat dependent on the quality and quantity of underlying technical information about the soils in the particular location, but the combined judgment of technicians and farmers should permit developing workable use classes. An admirable feature of the approach lies in the presentation of a number of physical alternatives for handling each class of land. This furnishes the starting point for economic appraisal, permitting a choice in methods of control best suited to the farm and farmer, and most likely to produce a satisfactory economic return.

Mr. Collier has mentioned the desirability of the physical scientist making findings available in ways that facilitate their use in economic evaluation. Further steps along this line would greatly increase the usefulness of the land use capability device for both farmer and economist. The various alternatives in handling land may be equally effective in erosion control but will resultant yields of crops necessarily be similar? Here are two fields of Class II land, the one farmed hard for 40 years; the other of virgin soil. Can the physical scientist venture estimates of probable yields for Class II land embracing such extremes, or must these be advanced only on the basis of a more detailed differentiation of Class II soils?

What aid can the physical scientist give in indicating the length

of the transition period, the amount of technical service required, and the variation in cash outlay involved in installing each alternative plan? Do we need land use capability considerations on two levels—the one a rough guide to desirable land uses and practices for the farm as a whole, and the second a more refined technique for application field by field; the latter furnishing a more justifiable base for estimates of probable future yields? Perhaps combinations of techniques applied in conservation surveys and those used in obtaining productivity ratings in current soil survey reports will both need to be drawn upon to supply these needs.

Having determined desirable changes in land use and cropping practices, major consideration turns naturally to the alterations in livestock enterprises and feeding practices that may result. If quality and quantity of forage increases will livestock be fed more heavily, will emphasis be placed on expanding numbers, or both? Here, as with crops, the aid of the technician is needed in providing reliable estimates of the probable effects on production. Economic appraisals quite frequently show the returns from an acre of pasture as greater than those from any other acre on the farm. Such comparisons carried to their logical conclusion would result in placing the entire farm in pasture. The fallacies thus frequently encountered in attempting to evaluate returns from a segment of the farm business are capably pointed out by Mr. Collier in a recent issue of the JOURNAL OF FARM ECONOMICS.[5]

Consideration of changes that may be needed in buildings, machinery and equipment form a part of the evaluation process. These can prove an effective barrier to adoption of conserving systems of farming. In large areas of the South, the one-mule cotton farmer has no mowing machine and few if any of the other items of equipment needed for handling forage crops. By way of contrast, farmers in some of the large scale potato producing areas are using 4-row planters, and 8-, 12-, and 16-row sprayers and dusters. These highly efficient machines are ill adapted to farming over terrace ridges, and until acceptable modifications are made the presence of this specialized equipment can prove as effective a bottleneck as the lack of equipment entirely.

Perhaps some of the most formidable barriers are those incapable of quantitative measurement—the intangibles not part of a budget-

[5] George Collier, Common errors in evaluating farm practices, JOUR. OF FARM ECON., vol. 23, November 1941, p. 877.

ing process. Innate distrust of movements sponsored by opposing political parties, reluctance to change of any kind save under the pressure of dire necessity—until these and similar impediments are removed, facts and figures advanced to demonstrate the benefits of conservation are likely to fall upon deaf ears.

The amount of individual farm budgeting it is desirable to do varies somewhat with the degree of change in farm organization that may be necessary to achieve conservation. Similarly, the necessity for close attention to areal, regional, and national effects varies with the number of farms undergoing change. With conservation programs reaching an ever widening portion of the farming public, provision must be made that the Nation's agricultural plant maintains balanced production of all its needs.

Having determined the kinds of changes that are desirable in the interests of long-time farm stability, a primary consideration is that of the costs involved. The tendency to use costs experienced under the demonstration phases of the conservation program as standards in current evaluations is apt to be very misleading. This was an experimental as well as a demonstrational period, and in most instances, cheaper and more efficient ways of applying conservation measures have been developed since that time. Farms admittedly were chosen that would make the best demonstrations and these were not always representative of the wide range in costs that are encountered in dealing with land in all stages of depletion. Furthermore, 20 year programs were telescoped into 5 years or less, generous grants of labor and materials hastening the day of effective demonstration.

Needed is a much more realistic appraisal of the cost of inputs *now*, care being taken to discriminate between annually recurring operating costs and the more infrequent capital outlays that presumably may be amortized over a period of years. Careful distinctions should be drawn between necessary cash inputs, contributions in farm labor and farm materials, and the various types of assistance available through Federal programs. As the Soil Conservation Service goes on a district basis assistance tends to be limited to that of technicians, but the Agricultural Adjustment Administration exhibits an increasing tendency to emphasize conservation in its schedules of payments. Mule power and homemade equipment may on some farms be the most practical method of obtaining needed terraces and the experience gained in their construction will go far toward insuring their proper maintenance.

Important factors in evaluation are the present stage and rate of soil depletion, and the amount of time that can safely be taken in achieving erosion control. Here again the appraisal of the physical scientist must necessarily undergird determinations of economic feasibility. Where erosion has progressed to advanced stages restoration of the land from the standpoint of the farm operator may have little economic justification and expenditure of public funds should be considered only if damage to the public welfare can be demonstrated.

For less extreme cases, the soils technician could perform a service by indicating the minimum controls needed at different levels of intensity. These might include the measures needed (1) to slow depletion to a negligible rate, (2) to maintain the soil fertility and (3) a level to provide for some degree of soil improvement. Accompanying these levels should be estimates of probable yields thus furnishing a basis for determining the level most economically feasible considering the farmer and his family on the land. Possibly farm plans could be developed providing for gradual progression of the farm through all these levels over a period of years, with resulting minimum disturbance to farm income. The combination of erosion control inputs that balanced against probable outputs will yield the maximum profit over time is an open field challenging the combined efforts of physical and social scientists.

In some areas only portions of the land in farms show evidence of serious soil depletion. Farmers frequently have been willing to permit the application of control measures to these fields but reluctant to make all the changes called for in complete conservation plans for the entire farm. Such partial programs have, for the most part, been discouraged by the Soil Conservation Service since emphasis on the segment tends to short circuit adequate consideration of erosion control upon the whole farm. Application of partial plans, however, is one means of slowing soil impairment where the need is worst at cost levels lower than might be experienced in attacking the whole farm problem in any one year. It has the added advantage of permitting the farmer to sell himself on the effectiveness of conservation measures by trying them out in a small way at first. Perhaps some intermediate ground can be worked out to permit the benefits of partial planning while still emphasizing its relation to the farm as a whole.

Two rather effective alibis have been advanced by economists for failure to provide adequate evaluations of conservation benefits.

One is that economic evaluation must necessarily be based on very definite information regarding the effect of changed practices on yields in different physical situations. The second is a natural outgrowth, namely that evaluation must be postponed until one or two rotations have been completed and at least the first effects on yield have had time to become manifest.

Mr. Collier has given a realistic picture of the problems involved in furnishing adequate physical data as a basis for economic evaluations. He has made clear that the tremendous diversity in physical factors, operational skills, and multiple practices, reflecting their influence on yields will always preclude careless generalization of results of tests over wide areas. He has not implied that the economist and the physical scientist have no obligation to furnish guidance *now*. The great danger in any widespread change in our farming systems is that such change proceed without guidance because those in the best position to estimate probable future effects refuse, in the vernacular, "to get out on a limb," preferring to verify tentative results before making them available. "What is needed as a guide for action is, not so much a final figure down to the third decimal point, but a fairly reliable indication of the *direction* of change likely to be introduced by the application of conservation practices. This should be supplemented by the best estimates of conservation technicians as to whether the change would be as much as 5, 10 or 15 per cent above or below yields now being experienced."[6]

This bespeaks the need for cooperation between the economist and the physical scientist in careful interpolation of present data and their collaboration to this end whenever and wherever questions arise regarding the economic feasibility of proposed conservation programs on the farm.

Alternative Plans and the Experimental Approach

Adequate evaluation of conservation benefits at the farm level involves consideration of the various alternative organizations through which a soil conserving system of farming may be achieved. This runs counter to some of the early thinking which held that conservation planning should concern itself only with the changes in primary production needed to prevent soil and water loss. The dis-

[6] Neil W. Johnson, Conservation—an objective or an ideal?, JOUR. FARM ECON., vol. 23, November 1941, p. 823.

posal of additional hay and pasture, it was said, was purely a matter of good farm management and no concern of the farm planner.

Rotation of crops and maintenance of soil fertility have been the rule rather than the exception in certain of our farming areas. Here the adoption of a few mechanical practices may be all that is needed to complete a soil conserving system of farming. In such instances changes in the farming system are so slight that lack of concern for shifts in secondary and even primary production seems excusable. Conversely, where radical changes in farm organization and management are involved, failure to consider all important alternatives and their probable income effects seems equally inexcusable.

This obligation to think through the possible ramifications of major changes in farm organization is increasingly recognized by farm planners. They are likely, however, even yet to stop at the first plan that will conserve soil without seriously upsetting the status quo on income. This falls far short of the ideal of achieving the plan that represents the highest profit combination, a goal the farm planner, already criticized for the costliness of his planning, can scarcely reach unassisted. Here is a fruitful field for research and one especially adapted to case farms representative of larger groups.

A growing interest is evident in the possibilities of satisfactory evaluation through at least two variations of an experimental approach. Three-way cooperation between the farmer, the farm planner and the research man is involved. After joint exploration of the physical and economic possibilities in various alternative plans, the farmer indicates his willingness to place one of them in operation. The research man then undertakes to "live into" the farm situation over a period of time, recording both quantitatively and qualitatively what happens as the conservation plan is carried out.

Special emphasis would be given to problems arising in the transition period and to careful analysis of the causal factors whenever changes in the original plan become necessary. The evaluation work would be on a level fully as intensive as that of a farm management route study and the "experimental farm" would serve as the sounding board for its group. Hindrances and helps noted on a few farms closely studied could be verified or disproved by checking these phases against other farms undertaking similar programs, information being released from time to time that would be of assistance

both from the standpoint of bench marks in evaluation and guides in farm planning.

Employment of the case method in the experimental approach does not insure successful relation of the problems of the case to the group it represents. Case analyses can become ingrown, faithfully reporting the details of the farm business but giving little attention to causal factors and the development of relationships that the conservationist can more generally apply. The relation of the case to the group is somewhat analogous to the relation of the text to the sermon. It is not the end in itself but merely the device through which we come to a greater appreciation of the problem at hand.

In the first type of experimental approach the farmer and the technicians would agree on the best possible plan from among alternatives already well proven. This would involve a minimum of risk to the farmer in shifting to a soil conserving system of farming. A second type differs in that drastic departures from conventional methods might be attempted as the result of budgetary explorations that pioneer along the frontiers of knowledge. With a consequent increase in risk, provision should be made to reimburse the farmer in case of loss. The latter type of experimental approach is being undertaken in connection with cooperative studies of low income farms, Farm Security Administration underwriting the risk factor.[7]

Evaluation of Possible Losses

Possibly one of the greatest current needs is the reverse of evaluating conservation benefits—that of evaluating losses that may accrue to soil resources as farmers attempt to meet production goals much beyond those normally achieved. Some farmers can expand production of soil depleting crops substantially without serious soil impairment while others attempting similar increases would jeopardize their very existence a few years hence.

If we learned anything from the lessons of the last war we will attempt to prevent such abuses. We are conscious of the immediate need for delineation of the areas where increased production may be purchased at too dear a price from the national as well as the individual standpoint. We are likewise aware that once again an

[7] News item, "Farm Security Administration joins Bureau of Agricultural Economics in Experimental Farm Program," Inside Bureau of Agricultural Economics, Vol. 2, No. 9, July 1941, pp. 17–18.

emergency is forcing action before we can set up wholly adequate safeguards.

Workers in the Corn Belt and Lake States have already given considerable thought to measures that can be employed quickly to bridge this gap. A map has been prepared differentiating areas according to priority for possible increases in soil-depleting crops.[8] Five classes are set up, the fifth being areas where no increase should be permitted except in dire emergency. Such a program could be effective only through adoption of bases of payment that would tend to encourage the type of changes least damaging to our agricultural plant. These might take the form of adjustments in allotments to permit farms in areas of first and second priority to increase production of soil-depleting crops while farmers in areas of third, fourth, and fifth priority would receive their payments for increased emphasis on the production of soil-conserving feed crops. These could be accompanied by payments for accomplishment of certain types of farm practices designed to increase production.[9]

A supplemental program of individual farm planning in which demands in the current year could be contrasted with desir ble long-time plans for the farm could be used as a means of adjusting boundaries between areas and erasing inequalities that would arise in any wholesale application of the plan.

DISCUSSION BY G. W. FORSTER

North Carolina State College

Soil erosion is evidently a complex if not an abstruse problem. To be sure, many phases of this problem can and have been measured. The soil physicists have, for example, designed instruments which measure accurately the rate of erosion for various soil types, under innumerable conditions, of slope, surface cover, and climatic conditions. Again, the soil scientists with the agronomists devised unique devices for the prevention and cure of erosion. These devices are referred to as soil erosion practices. Give the soil scientist and the agronomist unlimited means and they can and will conquer the most difficult problem of physical erosion. One marvels at their capacity to change the physical appearance of a badly eroded soil or a gullied hillside.

But, in spite of such phenomenal performances, the soil scientists and the agronomists admit that the problem of erosion is elusive. These tech-

[8] Farming adjustments in the Corn Belt and Lake States to meet defense needs, unpublished preliminary report of the Bureau of Agricultural Economics, September 1, 1941, pp. 46–48.

[9] T. W. Schultz, "A New AAA," Iowa Farm Economist, Vol. 7, No. 10, October 1941, pp. 14–16.

nical scientists admit that, allowing for the effect of all the technical improvement in better seed, fertilization, and methods of cultivation, the results are disappointing. "With every step forward we have slipped back almost if not quite so far" is an admission of no mean significance. It is epochal in character as such an admission has seldom, if ever, been made before.

As a matter of historical record, soil erosion has been much more destructive than the soil scientists or the economists are willing to admit. Not only is it true that large areas, such as the "dust bowls and wash bowls," but whole nations have been destroyed by this monster. Volney in his "Ruins" attributes these catastrophes, not to erosion but to human cupidity or that power of the mind to believe things which are not true, never have been true, and in the nature of things cannot be true. And as nations engaged themselves in this delectable occupation they gradually but surely pass out of existence.

Most soil scientists, and perhaps also most farm economists, have a "yen" for soil conservation. They believe that soil erosion is the key to the solution of all social problems. Stop erosion, increase the productivity of the soil, and paradise is yours. This is pure nonsense. It is an example of human cupidity in an extreme form. In contrast to this belief it has long been observed that soil productivity has been maintained under conditions most favorable to soil destruction. On the other hand, where the conditions have been the least favorable, the destruction of the soil has taken place. Or in two areas, equally subject to erosion, in one erosion has been checked, in the other it has not. The reason for this difference is difficult to state, but this subject in recent years has been subjected to investigation. The discovery and description of "cultural islands" is but one type of promising investigation in this field. One element evidently in the situation is *culture*. As the habits of thoughts of people vary, as people are preoccupied with certain ideas, they appear to develop different attitudes regarding the preservation of the soil and other resources especially human beings. Under some types of culture the soil although fertile originally, gradually but inevitably has declined in productivity. Under another type the productivity of the soil is maintained or even it is made more productive. We are thus forced to the conclusion that soil erosion per se is not the cause of the decline of nations nor of communities and any naïve attempt to correct a situation by soil erosion methods alone is doomed to failure.

If this analysis is correct, then it will be necessary first of all to determine for any given pathological community the possibilities of developing a rational culture, or one favorable to maintain the soil fertility once it has been improved. To do otherwise is to waste public funds. That this is true has been demonstrated on all soil erosion demonstration areas. The results show, almost invariably, that farmers are not now and are not going to maintain their terraces, pasture, or other practices which are essential to prevent soil depletion. Unless the farmers' attitudes are changed in a fundamental way, then the investment of public and private funds is unwise, as not only will the funds be lost but the rate of soil erosion may be increased.

When the development of a desirable culture appears, for any reason impracticably then one of two alternatives may be followed: (1) Abandon the area for agricultural purposes and use it for some other purpose, such as recreation, a game preservation, for forestry, or any combination of these uses. When this method is used, the farm operators should not be permitted to re-enter farming, unless subjected to some form of state or federal supervision. (2) The area may be subjected to some form of regimentation under which the people in the area would be compelled to do those things necessary to the rebuilding and preservation of the soil and to the gradual development of a desirable farm community. As regimentation would require the expenditure of public money, great care must be exercised in selecting the type of work to be done. It is clear that elaborate plans for wholesale terracing, meadow strips, and other means of preventing erosion should not be developed and put into effect. There should not be any wholesale sign-ups of farmers. To the contrary, work would be limited to those farmers who have sufficient managerial capacity to undertake the assigned tasks. The tasks may be expanded gradually to other farms. At all times the project as a whole must be subject to careful supervision.

It would be possible to discuss at great length the implications and ramifications of these suggestions, but enough has been said to indicate that our present methods of attack are defective, if not wholly wrong. The emphasis is now on soil erosion per se, whereas it should be on the social and economic causes which have been long at work in producing pathological areas. If a shift in emphasis were possible, then an action program could be developed which would strike at the heart of the problem. This suggested method of procedure is more rational than the one now in force which seeks to correct soil conditions with the belief that all will be well. This is wistful thinking of the crudest sort, and ought, for the sake of society, to be abandoned immediately.

It should not be assumed, from what has been said, that the present conservation program is a complete failure. I know personally some farmers who have been benefited by the soil conservation program and there are, no doubt, many such farmers scattered throughout the United States. But in those areas with which I am most familiar, I am convinced that the areas are not, as a whole, likely to be greatly benefited. Recent studies appear to indicate that farmers are prone to neglect the terraces which have been constructed, let their meadow strips deteriorate, allow their pastures to go down, because of weeds or overgrazing. The reason why these things are happening is that the social and economic problems have not been made an integral part of the soil conservation program.

DISCUSSION BY G. L. JORDAN

University of Illinois

Mr. Johnson criticizes the use of farm business surveys and farm account records on the basis that (1) too little time is usually devoted to their analysis, and (2) too much time used in their collection, and implies that

too much emphasis is placed upon the backward look rather than the forward look. Some farm management specialists would suggest that what is needed in order to make farm business survey and farm account records more valuable is to make sure that the records are analyzed by someone trained in farm management research.

An alternative method discussed in the paper is to compare results obtained by farmers cooperating in an organized soil conservation program with results obtained by non-cooperators. In this case Mr. Johnson recognized the large number of variables in addition to soil conservation practices that affect returns on any particular farm or group of farms. The limitations imposed by proper statistical treatment may require a larger sample than is available. When this method is followed, the need for confining the analysis to homogeneous groups cannot be emphasized too strongly. It is a most difficult assignment. Most workers have not had adequate samples to do this. Mr. Johnson is to be commended for his emphasis upon the need for a homogeneous sample.

If it were possible to segregate the cooperating and non-cooperating farms into a small number of homogeneous groups, it would then be possible to make a more detailed analysis of small samples within each group or sort out and study representative farms within the groups. The difficult task is to sort into a small number of homogeneous groups—difficult because of the great diversity of physical conditions, managerial ability, tenure of operator, size of farms, and other factors recognized by Mr. Johnson. Certainly he was right in indicating that signing versus not signing on the dotted line as a cooperator was not a significant basis for sorting to indicate the use of adequate or inadequate conservation practices on the farm.

Mr. Johnson appeared to favor the budget approach but emphasized that physical and social scientists must work together in providing tenable assumptions—assumptions concerning prices, costs, and production. This would include careful classification of land, possibly down to each individual field, in order to get a justifiable base for estimates of probable future yields.

I am inclined to point out the limitations of the budget method when estimates or assumptions are made without the background of farm business surveys or farm account records which Mr. Johnson appeared to consider too slow and time consuming. Who is going to set up the budget and upon what basis? Mr. Johnson would have us make periodic checks of actual results versus the budget. Certainly that would help eliminate some of the pitfalls, after a time, that might have been more adequately avoided by using farm records in the first place. Here again we run into the great differences in managerial ability, and factors other than soil conservation practices that affect economic returns. In Illinois, for example, we have observed ranges of 100 per cent to 150 per cent in livestock production with a given input of feed and labor. Shall we omit from consideration the farm operator's ability to utilize the crops produced?

It is very probable that no two budgets would come out with the same answer. It would depend largely upon the person making the estimates.

At Illinois we have used budgeting, not as a research tool for evaluating benefits, but as an extension tool for applying the results of research to a particular farm or group of farms. It would be a fair question to ask how the budget can be used to measure practices that the practical farmer may use to control erosion and maintain his farm income.

The experimental or research approach was mentioned by Mr. Johnson but does not seem to offer any particular advantages over other methods of evaluation. The difficulty of simulating conditions representative of large groups of farms is evident.

The paper under discussion did a good job of pointing out the necessity of tying up the changes in livestock enterprises with changes in cropping systems, the need for consideration of costs—current, recurring, and capital outlays, and the need to consider alternative plans for accomplishing results. The necessity to evaluate losses from erosion and loss of fertility was the last main topic discussed.

It seems to me that we have three feasible alternatives. One would rely upon our soil scientists to first evaluate changes in physical productivity under various soil treatments, crop rotations, erosion controls, etc., based upon experimental results. This would require experimental data for different types of land under various states of erosion and fertility and under various cropping systems. The cost of inputs requiring cash outlays can be measured at the time they are incurred. The returns may be converted from physical units, as determined by agronomists in cooperation with agricultural economists, to monetary values by using anticipated or average farm prices. This method would confine the measurement of benefits to the changes in the values of crops based upon changes in yields and shifts in acreages of the various kinds of crops. It would not take into consideration the effect as measured by utilization of the various crops as feed for livestock and changes in emphasis upon the livestock enterprises.

The second alternative is to base the estimate of the value of benefits upon what farm account records show actually takes place. If enough records are obtained, no budget is needed. Scientific workers can take records and get the answer in less time than it takes to set up a budget and, in the opinion of Illinois farm management specialists, have a more reliable basis than is likely to result from a budget based upon anything but farm account records. Enough records would be needed to be able to sort on the basis of soil types and other physical factors such as slope, size of farm, cropping systems and supporting practices in the same community having the same weather conditions. The paired sample technique based upon actual records might be used to obtain a homogeneous sample.

Of course it is difficult to obtain homogeneous groups but in many cases it would be possible to sort farms into two groups—those following and those not following approved soil conservation practices. Then it should be possible, with the help of soil scientists, to get records of soil losses, crop yields, livestock efficiency, labor input, and power and machinery input. In addition to farm financial records it might be desirable to make some time studies. Because of the wide variation in the ability of farm operators to feed and care for livestock efficiently that factor should not be left out

of an economic appraisal of benefits of using conservation practices, especially since a change in ratio of cash grain and forage crops would usually be involved. Changes in relative prices of grains and livestock and livestock products and relative prices of different kinds of livestock based upon changes in quantities produced would have to receive attention.

Dependence upon farm account records would admittedly be a slow procedure in areas where careful records have not been kept. With the increasing necessity to keep financial records for income tax purposes adequate records should soon become available, if the farm management divisions of the land-grant colleges and the U. S. Department of Agriculture are careful to encourage the proper type of record. At any rate, if available, actual farm records would seem to be preferable to other more arbitrary estimates or assumptions upon which a budget might be based.

The third alternative would be to set up the study from the beginning purposely designed to give homogeneous groups and thereby avoid the necessity of taking a large number of records. In this case it would be necessary to employ skilled technicians to measure (1) the adequacy of conservation practices and (2) the effect of the conservation practices upon earnings.

When farm account records are available their use would seem to have more possibilities than the other methods discussed either by Mr. Johnson or by me.

BEHAVIOR OF PRICES OF FARM PRODUCTS DURING WORLD WARS I AND II[1]

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ALTHOUGH the behavior of prices of farm products during World War I has been analyzed on numerous occasions and from many different angles, the fact that the United States is again involved in a war would seem to justify a review of some of the more important price developments during the earlier war period. Because of limitations of space this paper will be restricted to an analysis (1) of relative changes in prices of farm and other commodity groups in the farm wholesale and retail markets during the years 1914 to 1920; (2) of relative changes in the prices of some 27 different farm products; and (3) of some of the outstanding similarities and contrasts in price behavior between the two periods.

There were three crucial months in World War I: first, August, 1914, when the major nations of Europe became embroiled; second, April, 1917, when the United States entered the war as a belligerent; and third, November, 1918, when the Armistice was signed. This analysis, covering the years 1914 to 1920, thus includes seven months prior to the outbreak of World War I and the first two post-war years.

Farm, Wholesale, and Retail Prices up to November, 1918

The statement is frequently made that during World War I prices of farm products rose earlier and more rapidly than did prices of other commodity groups. This is incorrect, taking into consideration the full period of the war from August, 1914. American industry and some branches of agriculture felt the impact of the war long before April, 1917, when the United States entered as an active belligerent. In 1916 the index of wholesale prices of farm products stood at 118 (1910–1914=100), whereas the wholesale index for all commodities stood at 125, the indexes for chemicals and drugs at 198, for hides and leather products at 145, for fuel and lighting at 141, and for metals and metal products at 137. Wholesale prices of most manufactured products had thus risen earlier and to a greater extent during the first two years of the war than had wholesale prices of farm products.

[1] Paper No. 103, The Giannini Foundation of Agricultural Economics.

There had been no appreciable change in the general level of prices received by farmers during the first 18 months of World War I. The index of prices received by farmers (1910–1914=100) stood at 104 in January, 1916, as compared with 102 in August, 1914. July, 1916, marked the end of the second year of the war. In that month the index of prices received by farmers stood at 114. Thus in the first seven months of 1916 prices received by farmers had risen only 10 points. The inflationary process was getting under way—but slowly. By January, 1917, which marked the thirtieth month of the war, the upward spiral of prices was well under way. The index of prices received by farmers had increased to 141, or 26 points, since July, 1916. By March, 1917, the index had risen still further to 156.

The United States entered the war in April, 1917. In that month the index of prices received by farmers jumped 17 points, the greatest increase in any one month during the war period. In May, 1917, another increase of 12 points was registered, the index of prices received by farmers in that month being 185. Thus in the first five months of 1917 the index of farm prices had risen 44 points, as compared with only 39 points during the first $2\frac{1}{2}$ years of the war. The general upward trend of farm prices continued, but at a less rapid rate. When the war ended in November, 1918, the index of prices received by farmers stood at 205, or just about double the level in August, 1914.

As was stated above, wholesale prices generally rose at a more rapid rate than did prices of farm products during the earlier stages of World War I. In July, 1916, the wholesale commodity index stood at 122, as compared with an index of prices of farm products of only 114. After July, 1916, however, farm prices began to move upward at a more rapid rate than wholesale prices, so that by March, 1917, just before the United States entered the war, the indexes of prices received by farmers and of prices of wholesale commodities were about level (156). During the first two months after the entry of the United States into the war the index of farm prices jumped 29 points, whereas the index of wholesale prices increased only 19 points. The index of prices of farm products remained on a consistently higher level than that for wholesale prices of all commodities generally during the remainder of 1917 and the whole of 1918 and, in fact, until January, 1920.

The index of retail prices of food (1910–1914=100) lagged con-

sistently behind the indexes of prices received by farmers and wholesale prices of all commodities during the earlier years of the war. In January, 1916, the index of retail prices stood at 106, as compared with 105 in August, 1914. By March, 1917, the retail index stood at only 131, as compared with an index of 156 for prices of farm products and wholesale prices of commodities. By November, 1918, the retail price index had risen to 182.

Up to 1916 the prices of commodities purchased by farmers had risen to a greater extent than had prices received by farmers, indicating some decline in the profitability of the agricultural industry as a whole during the first two years of the war. From 1917 onwards, however, prices received by farmers rose more rapidly than did prices paid by farmers. In 1917 the index of prices received by farmers averaged 175 and that of prices paid by farmers 149, indicating a ratio of prices paid to prices received of 117. The ratio for 1918 was 115, indicating a continuance of the favorable position of agriculture.

Price Changes November, 1918, to End of 1920

Towards the end of 1918 it had become apparent that the collapse of the Central Powers was imminent. There was a widespread belief that business conditions would suffer a severe setback as soon as hostilities ceased and that prices would decline rapidly. This sentiment was reflected in a weakening of prices generally and especially of farm prices during the last few months of 1918. Normally, the index of prices received by farmers rises, between September and February. Instead, the index of prices received by farmers declined from a high of 213 in September, 1918, to 197 in February, 1919. The wholesale commodity index declined in the same period from 201 to 189. The retail price index, however, continued to rise to 185 in December, 1918, but then dropped sharply to 171 in February, 1919.

After the Armistice, the United States continued making loans to European countries, thus supplying them with credit to finance post-war reconstruction and to replenish badly depleted food stocks. Orders from non-European countries for goods, not procurable during the war, began to pour in. Foreign demand for American products, therefore, continued unabated through 1919 and into the first six months of 1920. Moreover, most of the restraints on prices imposed during the war were removed soon after

the cessation of hostilities. The continuance of foreign demand and the removal of price restraints soon caused farm and other prices to firm up. This engendered a widespread belief that the high prices that had prevailed during the last two years of World War I would continue indefinitely. A pronounced speculative spirit developed, under the stimulus of which prices soon began to soar to levels materially above those prevailing during the actual war years. Farm prices rose from a low of 197 in March, 1919, to a peak of 244 in May, 1920.[2]

By the middle of 1920, however, post-war reconstruction in Europe was well under way, the backlog of foreign orders had been largely met, and the United States was beginning to feel increased competition in foreign markets from revitalized European industries. As soon as this change in the foreign demand situation became apparent, prices generally began to decline, the decrease being most violent for prices received by farmers. Between May and December, 1920, the index of prices received by farmers declined from 244 to 148, a fall of 96 points, or an average decline of nearly 14 points a month. During the same period the wholesale commodity index declined from 244 to 176, a decrease of 68 points, or nearly 10 points a month. Retail prices of food declined even less rapidly from 228 in June to 181 in December, 1920, a decrease of 47 points, or about 8 points a month.

Changes in the Prices of 27 Farm Products

An analysis of changes in the composite index for all farm products tends to obscure the significance of variations in the prices of individual farm products and groups of products. It is logical to expect that during wartime the demand patterns (domestic and foreign) for individual farm products would be substantially different from those prevailing during peacetime. Defense and other needs may greatly increase the demand for some products, whereas the exigencies of war conditions may result in the drastic curtailment of demand (especially foreign demand) for others. Thus quite apart from any general inflationary tendency and changes in the supply situation for individual products, it is reasonable to expect

[2] Because of an expansion of output as well as the rapid rise in prices received by farmers, the gross income from farm production increased rapidly from 7.0 billion dollars in 1914 to 8.9 billion dollars in 1916, to an all-time high of 16.9 billion dollars in 1919. In 1920, notwithstanding the rapid decline in farm prices during the last six months of that year, gross farm income amounted to 13.7 billion dollars or nearly twice that for 1914.

that during wartime there will be marked variations in the degree and rate of change for such products. This is well illustrated by what happened during World War I.

In the United States grains, including flaxseed, and wool were the only farm products to record any substantial gain during the first year of the war which could be attributed mainly to the war situation. The index of grain prices in 1915 stood at 120 as compared with 102 for 1914 (period 1910–1914=100), and that in the face of two very good crop years for all grains except flaxseed. Farm prices of wheat and rye showed the greatest gains, with less substantial gains in prices of oats, barley, and flaxseed. Corn prices showed the least improvement. Notwithstanding a record crop of 897 million bushels of wheat in 1914, followed by a still larger crop of 1,009 million bushels in 1915, farm prices of wheat in May, 1915, were 72 per cent higher than the January, 1914, prices; farm prices of rye were 69 per cent higher. The farm price for wool in July, 1915, was 54 per cent higher than that for January, 1914, due partly to a curtailment of imports and partly to a decline in domestic production. The number of sheep and lambs in the United States declined from an average of 42.2 million during the years 1910–1914 to 37.8 million in 1914 and 36.3 million in 1915.

The prices of dairy products in 1915 were practically on the same level as in 1914, but all other groups showed a decline. The decline was most severe in the case of cotton, notwithstanding the fact that the 1915 crop of cotton was only 11.2 million bales, as compared with 16.1 million bales in 1914. Foreign demand for cotton was greatly curtailed as a result of the war. The short supply of cottonseed, however, brought about a substantial rise in the price of that commodity. In December, 1915, the price of cottonseed was 57 per cent higher than in January, 1914. Next to cotton, fruit prices showed the greatest decline, also largely because of the curtailment of export markets.

Prices generally started to rise in 1916, especially in the last half of that year. Grains continued to hold the advantage over other crops. In December, 1916, wheat prices were 98 per cent above the January, 1914, price of that commodity. During the same period flaxseed prices had advanced 100 per cent; rye prices, 95 per cent; barley prices, 69 per cent. Prices of corn, however, had advanced only 28 per cent and oats only 34 per cent. Cotton prices had recovered sharply from the low levels of 1915 and in December, 1916,

were 67 per cent above those of January, 1914. Cottonseed prices were 148 per cent higher. Other commodities showing sharp increases in price were wool, 95 per cent higher in December, 1916, than in January, 1914; potatoes, 114 per cent higher; and beans, 166 per cent higher. Of all commodities, beans had shown the greatest advance since January, 1914. The sharp rise in prices of potatoes in 1916 was due in large measure to a short potato crop in that year. Prices of dairy and poultry products and of meat animals showed advances substantially less than those for the other commodity groups.

The rapid increase in prices of farm products that started in the second half of 1916 continued into 1917. Fruits, dairy products, and poultry products continued to lag. The composite index of fruits in 1917 was only 118 (1910–1914=100); that for dairy products was 135; and for chickens and eggs, 155. Grains as a group continued to hold the advantage, followed closely by the miscellaneous group and by cotton. The following tabulation shows some of the astounding increases recorded in 1917 for a few selected commodities (January, 1914=100):

	Highest Point Reached in 1916	Highest Point Reached in 1917	Number of Points Increase
Corn	128	282	154
Wheat	198	307	109
Wool	196	371	175
Potatoes	214	409	185
Beans	266	414	148
Cabbages	163	407	244
Onions	410	145	265
Apples*	150	245	95
Tobacco*	150	245	95

* Average 1914=100.

The upward trend of prices continued into 1918 but at a less rapid rate. For wheat, corn, potatoes, beans, and onions the high points of prices for 1918 were substantially below the high points for the previous year. Although prices of all other commodities registered gains, the most outstanding increase was for oranges, the prices of which rose almost 257 per cent between 1917 and 1918. This increase was in large measure due to low production, resulting from a severe freeze in California and Florida. Substantial advances in prices were also scored by barley, rye, flaxseed, cotton, and dairy and poultry products.

Towards the end of 1918, especially from September onwards, prices of practically all farm products showed a tendency to decline.

This decline was carried on into the first three months of 1919. Declines in excess of 40 points between September, 1918, and March, 1919, were shown in the farm prices of corn, rye, barley, flaxseed, cotton, potatoes, and beans. Declines of between 15 and 40 points occurred in the prices of oats, barley, cottonseed, wool, and hogs.

After the initial decline in prices during the first three or four months of 1919, prices of farm products again began to rise. Prices of flaxseed, cabbages, onions, and pears registered substantial gains over the previous year. Less marked gains were shown in the prices of corn, wheat, beef cattle and hogs, chickens and eggs, butterfat, cotton and cottonseed, hay and potatoes, apples, sugar beets, tobacco, and peanuts. On the other hand, declines in prices were shown for oats, barley, rye, wool, beans, and market milk (in New York area).

During the first six months of 1920 prices continued to rise. The price of potatoes especially soared to a stupendous height in 1920. In June of that year the price of potatoes was more than five times higher than that in January, 1914. After June, 1920, however, the prices of practically all farm products started to tumble precipitously. Declines by December of that year in excess of 100 points from the peak of prices in 1920 were experienced by all the grains, by cotton and cottonseed, and by wool, potatoes, onions, apples, and tobacco. Declines of between 50 and 100 points were experienced by hogs, hay, beans, and cabbages. On the other hand, the prices of market milk and eggs were substantially higher at the end than in the middle of 1920—largely a seasonal situation. The declines of prices continued into 1921.

An interesting aspect of the behavior of certain farm prices during World War I is that the magnitude of seasonal fluctuations for certain products was greatly accentuated as the level of prices rose. For example, using the January price as base (equal to 100), the number of points between the highest and lowest points in each year for several products are shown in the following tabulation:

NUMBER OF POINTS DIFFERENCE BETWEEN HIGH AND LOW RELATIVES

	1914	*1915*	*1916*	*1917*	*1918*	*1919*	*1920*
Chickens	13.0	8.7	25.2	36.5	45.3	35.7	46.1
Butterfat	22.7	23.1	34.6	33.2	73.4	52.1	41.5
Market milk (New York)	34.4	32.5	53.6	56.0	102.7	40.3	55.0
Eggs	46.3	46.8	65.8	56.6	82.1	93.8	92.2
Potatoes	51.1	20.3	110.4	230.3	107.1	127.8	448.5
Beans	22.6	17.4	112.0	151.2	102.3	36.2	78.8
Cabbages	81.2	83.4	100.0	312.9	83.4	148.7	80.2
Onions	71.0	15.0	51.6	291.5	40.6	83.2	175.4

As is to be expected, all farm products did not attain their wartime peak of prices in the same year. The following data show that of the 27 different products included in this analysis the prices of four products reached a peak in 1917, five in 1918, ten in 1919, and seven in 1920:

1917	*1918*	*1919*	*1920*
Corn	Barley	Flaxseed	Wheat
Beans	Rye	Beef cattle	Oats
Cabbages	Lambs	Hogs	Chickens
Onions	Wool	Butterfat	Eggs
	Market milk (New York)	Cottonseed	Cotton
		Apples	Hay
		Pears	Potatoes
		Sugar beets	
		Tobacco	
		Peanuts	

It will be noticed that wheat prices reached a peak only in 1920. The previous highest price reached by wheat was in June, 1917—207 per cent above the January, 1914, price. During the remainder of 1917 and all of 1918 wheat prices showed very little variation, an indication of the effectiveness of wartime control over wheat prices. It was only after the removal of wartime controls in 1919 that wheat prices again began to soar from 253 in January, 1919 (January, 1914=100), to 285 in May, 1919, and then to 319 in June, 1920.

Comparison with World War II

It would be a grave mistake to assume that farm and other prices will behave in World War II in exactly the same manner as World War I. Although there are several interesting similarities in conditions during the first two years of both war periods, there are also very important differences which are likely to have a profound effect upon the course of prices in World War II.

Similarities would include the fact that the two wars began about the same month—August, 1914, and September, 1939. A period of 32 months elapsed between the outbreak of World War I and the entry of the United States as an active belligerent. In World War II, the United States entered the war 27 months after its outbreak. As in World War I, farm prices generally did not show any marked upward tendency during the first 18 months of World War II. In March, 1941, the index of farm prices stood at 103 (1910–1914 =100), as compared with 98 in September, 1939, and 94 in January

of the same year. Prices received by farmers thus increased only about 5 per cent between September, 1939, and March, 1941. Between March and September, 1939, however, farm prices rose 35 per cent, a rise similar to that which took place during the second half of 1916.

Contrasts or differences, however, are even more significant. World War I began at the end of a long period (since 1897) of rising prices of farm products, whereas World War II found farm prices and the agricultural industry very much in the doldrums, notwithstanding numerous forms of governmental assistance. At the beginning of World War I, Britain, and to a lesser extent France, were important creditor nations and the United States a net debtor nation. The Allies were, therefore, able to finance a large part of their earlier purchase of war supplies in the United States. World War II started with the United States a credit nation and with the finances of both England and France in very parlous shape. Allied credit in the United States was soon exhausted and loans (under Lease-Lend) early became necessary.

There are also important differences in the alignment of the opposing belligerents. During World War I, England, France, Russia, and later the United States, were allies of Italy and Japan. This meant a great excess of man power on the side of the Allies, who had access to war supplies from all parts of the world. Except in the North Atlantic, movement of troops and supplies was relatively free from attack.

The alignment of Italy and Japan on the side of Germany during the present war, the collapse of France, and the overrunning by Germany of the countries of Northwestern Europe have resulted, first, in large parts of the world becoming inaccessible, at least temporarily, to the Allies, and second, in a great increase in the problem of transporting supplies and troops. The protection of supply routes has become infinitely more difficult and more important than in World War I. The realignment of opposing forces is important because it will result in more supplies being drawn from countries, like the United States, whose industries are relatively free from attack and which are relatively accessible.

Another important factor in this connection is the great stress which is now being placed on the protective foods. During World War I, primary emphasis was placed upon the staples, grains, and meats. Equal emphasis is now being placed on dairy and poultry

products and fruits and vegetables. In view of this shift in emphasis it is to be expected that during the next few years wartime demand for poultry, dairy products, and fruits and vegetables will equal, if not surpass, the peacetime demand for these products. It is unlikely, therefore, that prices of these products will lag behind prices of staples to nearly the same extent as they did during World War I.

Of profound influence upon the trend of farm prices during the tragic years that lie ahead of us will be various anti-inflationary measures and methods of price control. The experience gained by the United States during World War I, together with the experience of the United Kingdom, Canada, Australia, and numerous other countries in the present conflict, would seem to indicate that fairly effective measures can be adopted to prevent, or at least retard, any marked inflationary process. Economists are generally agreed as to the principles of price control, although there still appears to be considerable difference of opinion as to detailed measures to make such control effective. The primary question in this country is whether Congress will pass the necessary legislation and, above all, pass it before the inflationary process, which appears to have started, gets out of hand.

Since 1933, the United States has also had much price-control experience of a different nature, namely, production and marketing control under federal and state laws. The primary purpose of these forms of control has been to raise or at least place a bottom on prices of individual farm products. Their effect, therefore, is inflationary rather than deflationary. So far, at least, there appears to be no tendency to abolish or suspend these price-influencing forms of control. Farm pressure groups would oppose such a move strenuously. Yet it is difficult to see how these price-raising measures will be reconciled with price-capping measures. There can be little doubt but that farm price-control measures are responsible for some of the present anomalous price situations.

In contrast to World War I, prices of cotton and cottonseed have shown the greatest advance of any group of farm products since the outbreak of the present war. In September, 1939, the index of prices of cotton and cottonseed stood at 76 (1910–1914=100); in September, 1941, at 146. This represents an increase of nearly 100 per cent during the first two years of the war, as compared with an increase in the general farm price index of only about 42 per cent. This increase has taken place in the face of very large storage

stocks, good crop prospects, and decreased foreign demand. This precipitous rise of cotton prices, notwithstanding an adverse supply-demand situation, can be ascribed almost entirely to governmental price-boosting actions.

A somewhat similar situation obtains in regard to grain prices. The Administration has requested a material increase in dairy and poultry production during 1942. Yet dairymen and poultrymen on the Pacific Coast claim that the Agricultural Adjustment Administration is pegging the price of grain (in response to the wishes of grain producers) at such high levels as to result in an unfavorable price-feed ratio for dairy and poultry products—and that in the face of heavy stocks of grains in the United States.

On the other hand, it is only fair to point out that the United States Department of Agriculture has developed, since the end of the last war, a very efficient administrative machine for determining our immediate and more distant needs of various types of farm products. This machinery is so organized that information can be widely disseminated among producers and effective steps can be taken nationally, regionally, and locally to put proposed production programs into operation. The existence of this machinery will undoubtedly aid in avoiding some of the occasional gluts and dearths developed during World War I and hence tend to prevent some of the more violent yearly price fluctuations.

A study of the course of farm prices during World War I does not help us materially in predicting what the course of farm prices generally or individually is likely to be in World War II. It is true that we will have similar powerful forces working towards general inflation of prices. On the other hand, we have better knowledge of the steps to be taken to prevent or at least retard price inflation. Better knowledge of the value of protective foods, a radical difference in the supply situation, the existence of government-sponsored price-pegging mechanisms for farm products, and planning for expansion or contraction of production in the light of possible needs will undoubtedly result in price patterns for individual farm products and groups of products radically different from those that prevailed in World War I.

THE LAND MARKET AND FARM MORTGAGE DEBTS, 1917–1921

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SOMEONE has said that the economic history of the United States is a history of land speculation. There is doubtless a great deal of truth in this statement. In the central part of the country this period culminated just after the close of World War I. The great land boom of those years marked the end of the period when farmers—at least in the Middle West—could make money by simply holding land and allowing it to appreciate in value. In 1920 a period of declining values began, which continued down to 1933. The severity of this decline had much to do with creating the state of mind in the farming states which led to their support of the various schemes for governmental aid that finally resulted in the Agricultural Adjustment Administration.

The United States Department of Agriculture has collected a valuable series of data regarding the course of land values and from time to time has published them in a series of circulars[1] with interesting analyses. The overall picture of the course of land values during the World War may be described as follows: for the country as a whole an index of values of land and improvements had risen to 108 by March, 1916, and to 117 by March, 1917, with the average of 1912–1914 equal to 100. If we are in a similar period, then 1916 is comparable to 1941 and 1917 to 1942 in the present period. The successive index figures were: 1918—129, 1919—140, 1920 (the peak year)—170, 1921—157, and 1922—139. Thus land values rose on the average by 70 per cent, nearly half of the rise occurring between March 1, 1919, and March 1, 1920, or in the year following the Armistice.

All geographical divisions of the country were affected by the rise but in different degrees, Table 1. The largest increases occurred in the southern and in the west north-central states. In the different geographic divisions the index figures for 1920, the peak year, were: East South-Central, 199; South Atlantic, 198; West North-Central, 184; West South-Central, 177; East North-Central, 161; Pacific, 156; Mountain, 151; New England, 140; Middle Atlantic, 136. The

[1] The last one, United States Department of Agriculture, Circular 548, October, 1939. Annual data are published each year in the April Crops and Markets.

greatest rise occurred in South Carolina, with an index of 230, and the least rise in Montana, with an index of 126. This rise in land values was, therefore, nationwide although its intensity and extent varied greatly in different parts of the country according to local conditions.

However, the timing varied considerably in different states. The index indicates that land values in Iowa rose faster than in Illinois. Thus, in 1917, the Illinois index was 111 while the Iowa index was

TABLE 1. FARM REAL ESTATE: INDEXES BY GEOGRAPHICAL DIVISION AND SELECTED STATES, 1914 TO 1922*

Geographic division and state	1914	1915	1916	1917	1918	1919	1920	1921	1922
United States	103	103	108	117	129	140	170	157	139
New England	100	99	102	112	117	123	140	135	134
Middle Atlantic	102	100	104	112	117	121	136	127	118
East North-Central	103	104	110	116	127	135	161	151	132
West North-Central	103	105	114	122	134	147	184	174	150
South Atlantic	103	98	108	119	135	161	198	174	146
East South-Central	103	99	109	120	140	162	199	163	149
West South-Central	104	100	103	116	134	143	177	159	136
Mountain	100	98	98	106	117	130	151	133	122
Pacific	106	107	111	122	129	134	156	155	151
New York	102	100	103	109	115	118	133	123	116
Illinois	103	102	105	111	119	130	160	153	126
Iowa	104	112	128	134	145	160	213	197	162
South Carolina	101	94	98	107	122	162	230	186	126
Montana	103	100	94	100	106	114	126	105	96

* U. S. Department of Agriculture Circular No. 548, Table 1, p. 4.

134. Two years later in 1919, the Illinois index stood at 130 and the Iowa index at 160. In South Carolina, previously noted as the state where the peak came, the first rise occurred between March 1, 1917 and 1918, and the real rise in 1918–19. The real estate market is, of course, a series of local markets. Similar tendencies have developed in the last two or three years. Activity developed at different times in different areas.

Periods of rampant speculation in values are not a rare phenomenon. The rather localized boom in Florida real estate, which made the peak in the price of Florida farm land come in 1927 when it was nearly 50 percentage points above the 1920 peak; or the stock market boom which ended in 1929 are recent examples. History furnishes many illustrations.

The elements of these speculative periods are similar: a basis for

increased earnings appears, people begin to buy equities in the property which gives rise to these earnings, these equities begin to advance in price, then they begin to buy on the basis of further advance in prices, looking to increase in value of their equities rather than to income.

The land boom of World War I came at the end of a long period of rising land values. The older sections of the country had seen earlier periods of increases and decreases, such as during and after the Civil War. The newer sections had seen brief periods of speculation, followed by readjustment. In the older sections land values had been on the upgrade since around the turn of the century when the general level of prices began to rise, and in the newer sections the general trend of land values had been upward since the land was settled.

By the outbreak of the World War the western movement to new lands was largely over and some back tracking toward the east had set in. For example, many western people moved into certain sections of New York state about this time.

In economic terms we had reached or gone past the extensive margins which could be farmed to advantage and the population had turned back to marginal areas in the older regions, seeking for lands which could be advantageously farmed. In this period development of irrigation and reclamation projects were likewise an expression of the search for new lands to cultivate.

The rise in prices of farm products and in farm incomes after the middle 1890's and the exhaustion of the supply of good lands for settlement caused a rise in values and created a psychological attitude that lay back of the war-time rise in values. People came to believe that the trend in values must inevitably be upward. To share in this rise or to protect oneself against the effect of a future rise, if one were a working farmer, one must own land.

Moreover, there was no great supply of land on the market at the beginning of World War I. Earlier periods of speculation in any large area had been pretty thoroughly liquidated. Lending agencies did not have an accumulated stock of farms as the result of unfavorable experience in an earlier period of lending.

The background was therefore set for a period of land speculation: incomes and land prices had been rising; no good lands were left to be occupied; marginal areas were being developed. Then came World War I. Farm prices rose; farm earnings increased. This

is an old story; it need not be repeated. The same process has been taking place during the past year. People bought to get an equity in the property which yielded the higher income. Once the rise got under way, people bought to profit from a further rise. Let me repeat, the greatest rise occurred after the Armistice was signed.

The ratio between prices of farm products and of goods bought by farmers should be a fairly good indication of the profitableness of farming. For the period under review these are shown in Table 2.

TABLE 2. INDEXES OF FARM PRICES AND PRICES PAID BY FARMERS AND CHANGES IN LAND VALUES, 1915 TO 1921
1910–1914=100

Year	Farm prices	Goods bought	Farm prices in relation to goods bought	Change in land values, March to March[a]
			(percentage points)	
1915	98	105	7 less	5 increase
1916	118	124	6 less	9 increase
1917	175	149	26 more	12 increase
1918	202	176	26 more	11 increase
1919	213	202	11 more	30 increase
1920	211	201	10 more	13 decrease
1921	125	152	27 less	18 decrease

[a] March of year noted to March of next year.

Prices of farm products did not rise above the cost of goods bought by farmers—when calendar years are used as a basis for measurement—until 1917. Even so the land value index rose 5 points between March, 1915, and March, 1916, and 9 points in the next year. For the four-year period, 1917 to 1920, prices of products sold were relatively higher than prices paid; in this period the largest increases in land values occurred. In the latter part of 1920 farm prices dropped sharply in relation to costs, and between March 1, 1920, and March 1, 1921, the land value index dropped 13 percentage points. It is evident that the increase in land prices in World War I was related to the sharp rise in prices of farm products: these went up on the average somewhat over 100 per cent and for a period of four years were relatively higher than were the prices of goods that enter into farm costs.

It was noted earlier that land values increased by the greatest percentage in the southern and in the west central states, or in the areas where cotton, grain, and meat animals contribute most to farm income and rose least in the northeastern states where dairy and horticultural products are important sources of income.

The average indexes of farm prices for the period, 1918 to 1920, for different groups were: cotton and cottonseed—247; grains—230; meat animals—195; dairy products—183; fruits—180.

The fact that the prices of cotton and of grains increased more than did prices of the other groups undoubtedly contributed to the relatively greater increases in land values in the regions where the largest rise occurred.

Capitalization Process in a Period of Speculation

Most agricultural economists will agree that the value of land bears some relationship to its net income. The relationship is expressed in the well-known formula: annual income divided by the rate of capitalization equals value. Obviously this formula does not provide a basis for determining values in a period of temporarily high incomes because it assumes the annual income to extend indefinitely into the future. In a war period we are dealing with a temporary period of high incomes. As pointed out in my book, *Financing Agriculture*, the problem is the determination of the present worth of a series of incomes to be realized over a limited period and the appropriate formula for determining any justifiable increase in value under these conditions is: expected increase in incomes $(i) \div (1+r)$ plus $(i) \div (1+r)^2$ plus . . . $(i) \div (1+r)^n$. Under the usual capitalization procedure, assuming that a farm earns $1,000 per year and that a 5 per cent return is desired, its value would be $20,000. A period of temporarily high prices comes along which doubles the income of this property for a period of 4 years. If the new income is capitalized on the assumption that it will be permanent, then the value of the farm will be doubled. This is obviously an error in judgment because the present worth of an annual income of $1,000 to be obtained for only four years is something less than $4,000, say about $3,600.

In United States Department of Agriculture Circular 548 is reported a series of cash rents from the state of Iowa. These averaged $4.50 per acre for the 5-year period, 1910–1914, after allowance for taxes, depreciation, and repairs. These rents were for land valued at $112 per acre. This suggests a rate of capitalization of 4.04 per cent. In 1920, the net cash rents averaged $7.62. Capitalized at 4 per cent, this is equivalent to a capital sum of $190. Actually the reported value was $255. This would suggest that not only was the new income capitalized but that some allowance was made in

expectation of a further rise in value. But this is only suggestive, for cash rents are sticky, lagging behind changes in income, and it is probable that incomes to operator-owners of similar land increased more than is here indicated.

Capitalization formulas represent an effort to rationalize land values. But in a land boom irrationality rather than rationality tends to dominate. People buy land because it has risen in price and they become convinced that it will rise more. Not the income from its operation but profits from expected increase in its value tend to dominate the situation.

Effect of Land Boom on Debt

Along with this rise in land values there was naturally a very large increase in debt. Debts are largely created in agriculture when property is acquired, and they are liquidated, it may be noted, when title to the property is lost. Rising values are associated with increasing activity in sales. To effect transfers large amounts of credits are required. The overall picture of the World War period is best indicated by the gross increase in mortgage debts. According to estimates of Wickens[2] the debt in 1910 totaled $3.3 billion; by 1920, it had increased to $7.9 billion, an increase of $4.6 billion, or about 137 per cent. Mortgage debts continued to increase after 1920, so that in 1925 they aggregated $9.4 billion dollars or nearly three times the 1910 figure. This increase from 1920 to 1925 reflected in large part the funding of short-term debts or of debt-servicing charges incident to the financing of land acquired during the period of high prices. It does not need to be repeated that the weight of this debt and the difficulty of meeting the high level of debt charges created by it had much to do with the long period of agitation for farm-relief in the 1920's.

This increase in debt took place in all parts of the country. In New England the increase was about 70 per cent; in the East North-Central States, about 100 per cent; in the West North-Central States, about 150 per cent; in Iowa, about 150 per cent; in the South Atlantic States, about 140 per cent; in South Carolina about 150 per cent; in the Mountain States, where settlement was still going on, the increase was 380 per cent.

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[2] United States Department of Agriculture Technical Bulletin, No. 288. Farm mortgage credit, 1932.

Who Financed the Land Boom of 1917–1920?

Currently there is much talk about controlling land values through controlling credit, which provided the basis for the expansion in mortgage debt between 1910 and 1920. The World War I experience does not suggest that this will be very successful. The Bureau of Agricultural Economics has published a series of reports dealing with farm-mortgage recordings. In South Carolina—the state which experienced the greatest relative rise in land values—newly recorded farm-mortgage loans were distributed according to mortgagees for the four-year period 1917–1920, as follows:

Individuals	61 per cent
National and state banks	22 per cent
Federal land banks	4 per cent
Insurance companies	6 per cent
Others	7 per cent
Total	100 per cent

In Iowa, a state where the rise in values was very considerable, the distribution of newly recorded mortgages in this period was:

Individuals	57 per cent
National and state banks	15 per cent
Federal land banks	2 per cent
Insurance companies	18 per cent
Others	8 per cent
Total	100 per cent

In both states the loans in these years were made chiefly by individuals, presumably owners of the sold property. Commercial banks were fairly important as mortgagees and undoubtedly advanced additional money on individual lines of credit, which was used in land speculation. The Federal land banks were unimportant, having just been organized and in the process of finding a modest place for themselves, a process which continued until the great refinancing period of the 1930's in which they became a more dominant factor in the situation. Insurance companies were unimportant as mortgagees in South Carolina in this period as well as later, but in Iowa they made slightly less than one-fifth of the recorded mortgages for the four years. It is worth noting, however, that in 1917 they made 29 per cent of the total but, as values rose, they reduced this to 13 per cent in 1919, indicating that they backed away from loans as values advanced.

To put it briefly, the land boom of World War I was financed by

individuals with some help from commercial banks in most sections and from insurance companies in certain limited areas. It is quite likely that, even though institutional lenders may continue conservative lending policies in the event of another land boom during this war, many individuals will be willing to sell farms for more than they believe them to be worth in the long run and to take mortgages for a substantial proportion of the sale price. More conservative policies are to be expected from commercial banks in the period ahead as the result of the great purge of the more speculatively-minded bankers in the period from 1920 to 1933. Also the closer watch on loan policies by state and national banking examiners will tend to check participation by banks in the financing of a land boom.

Analogies with the Present Period

We are now in another World War. Many people are concerned with a boom similar to that of 25 years ago. In fact one of the peculiar things about this period is that many people seem more concerned about the dire consequences expected to follow this war than about what needs to be done to win it. My own opinion is that before we can tell much about what is going to happen when the war ends, we need first to know its outcome in greater detail than is now visible. There are some similarities between the situation with respect to land values in this war and the last, but there are also many differences. Farm incomes have risen in this period and will probably rise more, price control measures or not. Prices of products with inelastic supplies must rise when demands increase as they inevitably do for foodstuff in a period of rapidly rising national income and increased demand. By and large supplies of farm products are relatively inelastic. With the exception of the little leeway provided by our accumulated ever-normal granary stocks of feedstuffs, supplies of food will not increase much in the period ahead. This rise in farm incomes will provide not only the basis for higher land values but also the opportunity for those who own or operate land to accumulate equities with which to make down payments on farms. It will indeed be unfortunate if such temporary increases in incomes are capitalized into values on the expectation that they will be permanent. In many areas the market for land is now very active and prices are advancing. As usual the situation varies considerably in different areas.

But there are many differences between the present and the period of World War I:

1. There has been no long period of rising land values to create a deep-seated belief that there are no limits to values, as occurred in many parts of the country in the period before World War I. According to the government indexes land values have risen from an index of 73 in 1933 to 86 in 1941. But this has been somewhat localized and is nothing like the persistent improvement that occurred in the years before 1914.

2. The belief that land values must rise indefinitely was shattered by the 13-year decline from 1920 to 1933.

3. Cash expenditures by farmers for automobiles, better schools, better roads, household improvements, and so forth, are higher now than before World War I; and so a smaller proportion of income accumulates to buy land.[3]

4. There is considerable skepticism regarding the foundations under farm incomes. Farmers are aware of the large part that government expenditures and subsidies play in current incomes. They have no great faith in their permanence.

5. There are a number of men, particularly in the areas of commercial agriculture, who are now more interested in farm operation than in ownership. It is worth noting that during the period of the Napoleonic Wars a similar group developed in English agriculture.

6. Finally, creditor agencies have a considerable accumulation of farms as the aftermath of the period of liquidation which followed the decline in land values. Also many farms are in the hands of people, estates, etc., who have not sold because of the low level of values in recent years. This supply must be cleaned up before any scarcity of farms develops in the real estate market. Although these farms are now being sold quite rapidly, the time interval needed to liquidate them may delay the emergence of a period of scarcity for a sufficient interval of time to prevent a real rise in values from developing. For these reasons the rise in land values induced by the rise in farm incomes which will accompany this war is likely to be more moderate than the rise from 1915 to 1920.

Since September, 1939, a great deal of activity in farm real estate

[3] This was written before the United States became engaged in the war and before various forms of rationing were imposed. Impossibility of spending increased incomes for some of these items will reduce the influence of this factor. The effect of this curtailment may be offset, however, by heavy purchases of government securities by farmers.

has developed in the Midwest. Accumulated inventories, particularly of the better farms, are being liquidated. Some increases in land prices have occurred, again chiefly for the better lands. These are normal reactions to better incomes and prospects for further improvement. But they furnish no clues as to the likelihood of a repetition of a land boom such as occurred in World War I. This will depend primarily on the duration and extent of the rise in prices and spendable farm income. A large scale movement of city capital into farm land might lead to a considerable rise in values. In limited areas something of this sort might now be under way. In the final analysis, values will depend primarily on what people are willing to pay and the many unknowns in the current situation make this difficult to predict. People who invest their money in land will do well to bear in mind the lesson of the land boom of World War I. They must be prepared for and able to stand the financial consequences of drastic changes in values.

AGRICULTURAL LABOR IN THE FIRST WORLD WAR

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AS THE UNITED STATES enters its second great war effort in a quarter of a century, public attention has largely focused upon the problems of military production in terms of planes, tanks, ships, and the like. Though less spectacular, the production of food is likewise essential for successful prosecution of the war, and it is this task with which American agriculture has been charged. But to produce the vast crops that are needed, we require a tremendous labor force on the farms of America. Even in the spring and summer of 1941—when our economy was still in its half-hearted "defense" stage—reports of farm labor "shortage" were heard from almost every part of the country. The problem of supplying sufficient agricultural labor will be much more acute in the war years to come than it was last summer, and the solution of this problem will be a prerequisite for victory. It seems desirable, therefore, to look back twenty-five years to see how the same difficulties were met in World War I.

Even before this country entered the last war, farmers had felt the impact of events abroad upon their labor supply. As orders for huge quantities of supplies poured in from the Allies during 1914–16, industrial production increased steadily, necessitating an increased supply of workers. Almost simultaneously, the war stopped the flow of foreign immigrants to this country, thus shutting off the traditional source of new industrial workers. Desperate for more labor, urban employers raised wages and sent their agents all through the rural and farm areas to secure new manpower for their machines. Attracted by higher city wages and the glib promises of labor agents, many agricultural laborers went to the cities hoping to improve their fortunes and abandon forever the low wages, long hours, and back-breaking toil of farm work. This pre-war drift from agriculture was probably felt most keenly in the South, where racial friction, the dislocation caused by flood and boll weevil damage to crops, and particularly poor working conditions made Negroes most receptive to the blandishments of labor agents. It has been estimated that in the period 1914–19 over 400,000 Negroes left the South for Detroit, New York and other urban industrial

centers, most of these workers having previously formed part of the South's farm labor supply.[1]

The United States' actual entrance into the conflict intensified all these forces tending to drain farmers' labor supply away and added new needs for manpower. Not only was there a necessity for additional industrial help, but the Army entered the picture with first claim to all men through the draft mechanism. And, throughout the country, the building of new army camps and munitions factories created new and more lucrative work alternatives to many who helped raise our crops. One result of this intensified competition for workers was that average agricultural employment in the United States was 5 per cent less in 1918 than in 1916, a drop of about 650,000 laborers. The average number of family workers declined about four times as much as the number of hired workers.[2]

At the same time that farmers met this intensified competition for labor, their need for help increased sharply. The nation called for record crops, and the slogan "Food Will Win the War" resounded through the countryside. Thus the farmers' labor supply dwindled while their requirements shot upward. Yet the miracle was accomplished and production of foods and fibers mounted to meet the needs of this country and its Allies. All this is similar to what the United States has undergone since September, 1939.

Increased mechanization of farming was one of the first results of the war's impact. In 1917, for instance, the number of tractors sold for use in the United States doubled the 1916 mark; and in 1918 it doubled again.[3] The sales of other types of farm machinery soared also with consequent gains in efficiency and diminution of labor needs. Comparing the period 1917–21 with that of 1909–13, average output per agricultural worker increased eleven per cent in less than a decade,[4] reflecting in part the progress of the war and post-war years in mechanization.

But the increased use of machines alone would not have sufficed to meet the problems raised by the intensified competition for labor which farmers faced in 1917–18. Insofar as this competition was economic in nature, it had to be met in those terms. The rising

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[1] E. J. Scott, Negro migration during the war, New York, 1920, p. 3.

[2] E. E. Shaw and John A. Hopkins, Trends in employment in agriculture, 1909–1936, Philadelphia, 1938, p. 11.

[3] Agricultural Statistics, 1940, p. 560.

[4] John A. Hopkins, Changing technology and employment in agriculture, Washington, 1941, p. 182.

prices for farm products helped agriculture to keep pace with alternative occupations in terms of attractiveness of compensation for the farmer and his family. For hired hands, the economic response can be partly summarized in these data: taking the 1910–14 average as our base, farm wages had risen only thirteen per cent by 1916, but in 1917 they rose another twenty-eight per cent, and in 1918 thirty-six per cent more.[5] Between 1914 and 1919, the average money income per hired farm worker doubled.[6]

But increased money wages and incomes do not tell the whole story. Workers' living conditions and food were improved, and their grievances were heard more readily as their alternative job opportunities multiplied. In the South, Negroes gained social status and greater economic returns. School conditions for their children were improved.[7] Thus the gains of hired farm workers during the war period considerably exceeded those pictured by wage and income data alone.

The importance of these factors in the battle to retain the agricultural labor supply may be indicated by the following statement by Assistant Secretary of Labor Post:

> "Whatever shortages of labor existed in agriculture during the war period were relative to the wages, hours, and housing conditions of farm labor. . . . Two-thirds of the farm labor shortage is imaginary and the other third can be remedied. . . . It is true that there is a shortage of experienced farm help in many sections. There are, however, enough idle men in the cities to fill the gaps. Why, then, do they not go to the farms? The chief causes are low farm wages and poor working conditions. It is significant that in the States where wages average $50–$70 per month there is no shortage of farm help. The shortage reports come from the States which pay $15 to $40 per month. The degree of shortness varies with the lowness of wages."[8]

Yet even with increased mechanization, higher wages, and improved working conditions, farmers might have lost out in their efforts to secure sufficient workers because of the disorganized condition of the farm labor market. Before the World War, most placement of farm workers was on a rather hit and miss basis; there was no widely used mechanism for bringing together farmers needing help and workers needing jobs. Sad experience early in the war

[5] Agricultural Statistics, 1940, p. 572.
[6] Wages and income of farm workers, 1909 to 1938, Monthly Labor Review, July, 1939, p. 63.
[7] Scott, op. cit., pp. 88–90.
[8] U. S. Employment Service Bulletin, April 9, 1918, p. 4.

showed that public announcements of farm labor shortages, accompanied by appeals for workers, were inadequate to solve the problem. They frequently resulted in confusion, waste, and loss to all concerned, and could not be allowed by a nation fighting for its life. Obviously some agency was needed to bring order into the farm labor market; to help recruit the skilled farm hands needed all through the crop season or year, as well as large numbers of semi-skilled and unskilled workers for the harvests and other periods of peak labor needs.

Organization to meet this problem began soon after April, 1917, largely on a state and local basis with Ohio a conspicuous early starter.[9] In a relatively short time most of the country was covered by a network of agencies designed to aid farmers in their search for workers; usually these were part of newly formed or expanded state employment services. The Federal government had no national machinery ready for the task, since the few employment offices operated by the Department of Labor's Bureau of Immigration were totally inadequate.[10] Although no additional funds were available for the job, the Department of Agriculture assigned the Office of Farm Management to assist in meeting the farm labor problems.[11]

The Office of Farm Management assigned each state a farm help specialist who helped coordinate the work locally, and facilitated cooperation among different states.[12] The details of organization differed from state to state,[13] but the general outline was this: Each agricultural county had a farm labor representative serving its needs. These men sought to gather all essential information regarding their area's labor needs and to recruit local workers. If the supply of local help was insufficient, appeals were made to state headquarters which instructed its agents in counties with surplus labor to direct workers to deficit areas. Where particularly large numbers

[9] Fred C. Croxton, War employment work in Ohio, Monthly Review of the Bureau of Labor Statistics, June 1917, pp. 995–1002.

[10] Ibid., March 1918, p. 568.

[11] E. V. Wilcox, The farmer's labor problem, The American Labor Legislation Review, March, 1918, p. 38.

[12] Ibid., pp. 39–40.

[13] For detailed accounts of particular state organizations, cf.: A. E. Grantham, Lessons in solving labor, credit and other production problems, The Annals, Nov., 1917, pp. 210–223; W. M. Leiserson, Mobilizing and distributing farm labor in Ohio, Monthly Review of the Bureau of Labor Statistics, April, 1918, pp. 781–791; R. L. Adams and T. R. Kelley, A study of farm labor in California, Circular No. 193, California Agricultural Experiment Station, Berkeley, 1918, pp. 23–24; D. D. Lescohier, The labor market, New York, 1919, pp. 302–305.

of workers were needed, as for the wheat harvest, the Federal Government worked with the states concerned to assure that an adequate work force would be available.

A description of the Minnesota organization may help make the foregoing a bit more concrete.[14]

County labor directors—usually the county agents—were appointed by the state headquarters, and under each was a corps of local representatives taking care of smaller areas. These latter received no salaries but were picked partly because of their patriotism, and partly because self interest could be made to take the place of wages in their cases. Bankers, merchants, implement dealers, lawyers and farmers were among those who aided. "Farmers were seldom satisfactory representatives. The work was to them a burden without commensurate benefit. But to the others it brought business, friends, valuable good will."[15]

Farmers had to place orders with the local agent—giving full data on number of workers desired, when and for how long they would be needed, wages offered, and the like—since the state office would not accept requests for aid directly. This enabled the local agent to fill as many jobs as possible with local men—desirable from the standpoint both of efficiency and of stimulating economic welfare in the locality—while the state office knew it had a responsible man in each area whose orders it could trust, and to whom it could send workers for distribution to farmers. Within a short time, most Minnesota counties were learning that it was possible to get along on the local labor supply without depending upon the reserves in Minneapolis and St. Paul where workers were needed for the industrial tasks of the war program.

By means of such organization some degree of order was brought into the farm labor market. The state and federal organization did not work perfectly, of course. Farmers complained that laborers sent them did not know a pig from a cow, and were surprised to find that farm work required skill and care. Workers unaccustomed to farm conditions complained bitterly about long hours, low pay, and hard work of a seemingly menial nature. But these complaints were relatively few and diminished as the farm labor representatives became more experienced in their tasks. The result was that despite the tremendous drains from the army and from non-agri-

[14] This is summarized from Lescohier, op. cit.
[15] Ibid., p. 303.

cultural production, the Secretary of Agriculture could report for 1917: " . . . although the largest acreage on record was planted, the great crops of the year were harvested under difficulties not appreciably greater than those in normal times."[16] And few indeed were the acres lost because men could not be found to cultivate or harvest them.

Since no comprehensive statistical record of placements made in 1917 seems to exist, it is difficult to give a precise estimate of the magnitude of the work done. The few available data show that 35,000 workers were placed in Kansas, 25,000 in Illinois, 20,000 in Oregon, 15,000 in Nebraska, 12,000 in Indiana, 10,000 in Missouri, "and proportionate numbers in practically all other states."[17] In the grain belt, particularly, the pressing problem of the wheat harvest's labor needs was solved with the Federal Employment Office in Kansas City playing a major role in securing and directing laborers.[18]

At the beginning of 1918, the Department of Labor revamped its entire organization for recruiting workers. The United States Employment Service was separated from the Bureau of Immigration and became an independent, greatly expanded organization operating over the entire country, with a Farm Service Division as one of its four main component sections.[19] During the course of the year all the various state services were integrated into this agency, while new forces were also brought into the work. Thus all 3rd and 4th class postmasters and rural letter carriers were made farm labor agents. Farmers gave these men orders for workers, and these were transmitted to the proper farm labor representative. Similarly, would-be agricultural workers could apply for jobs by filing their qualifications with their local postmaster and indicating their desire to work.[20] In some states rural telephone companies joined in the work, directing their operators to call farmers on their lines at least once a day to inquire as to their labor needs, and then to forward this information to the proper office.[21] Over 200 newspapers in various parts of the country served as volunteer farm labor recruit-

[16] Annual reports of the Department of Agriculture for the year ending June 30, 1918, Washington, 1919, p. 35.
[17] Ibid., p. 492.
[18] Lescohier, op. cit., p. 187.
[19] Monthly Review of the Bureau of Labor Statistics, March, 1918, p. 568.
[20] C. F. Stoddard, How the U. S. Employment Service is mobilizing workers, ibid., May, 1918, pp. 1247–1248.
[21] U. S. Employment Service Bulletin, June 4, 1918, p. 1.

ing agencies, assigning space each day for free notices of farmers' needs and donating the services of a member of their staff to act as a farm labor agent.[22] Movie shorts were made and shown in theaters throughout the country to encourage workers to volunteer for farm work, and to induce farmers to use the employment service's facilities.[23] Through this agency's efforts, too, an attempt was made to protect the agricultural labor supply by prohibiting recruiting of farm labor by other industries.[24]

For 1918, complete records of workers placed are again unavailable, but the number was certainly large. Between February 1, 1918, and August 1, 1918, 106,860 permanent farm workers were placed,[25] exclusive of harvest and other part-time labor. In Kansas, alone, an additional 18,000 workers were recruited to aid that state's harvest,[26] and other states also obtained large numbers of temporary workers. The upshot was that the record crops of 1918 were cultivated and gathered without loss to the nation.

Although the general organizational efforts have been sketched above, we may look in somewhat more detail at some of the special phases of the effort to assure American agriculture of its needed labor.

To help conserve the existing supply of farm workers, special treatment was given them by the draft. Thus a War Department order of March 12, 1918, directed local draft boards that " . . . where it is shown that a registrant is completely and assiduously engaged" in agricultural labor, he "shall be deferred to the foot of the quota of his board so long as he continues to be so engaged." Men receiving this deferment were to be drafted immediately upon leaving farm employment.[27] Many drafted soldiers were given leaves from time to time to go home and help with the harvest or other essential farm operations. An agreement was concluded with Canada in 1918 providing that she would not send out recruiting agents to enroll United States agricultural laborers and take them to Canada. Instead the Canadians placed orders with the U. S. Employment Service on the understanding that their needs would be satisfied after our requirements had been met.[28] In 1917, the

[22] Ibid., July 23, 1918, p. 10.
[23] Ibid., p. 13.
[24] Monthly Review of the Bureau of Labor Statistics, Sept. 1918, p. 777.
[25] U. S. Employment Service Bulletin, Aug. 13, 1918, p. 6.
[26] Ibid., Sept. 10, 1918, p. 4.
[27] Industrial and agricultural labor and the next army draft, Monthly Review of the Bureau of Labor Statistics, April, 1918, p. 835.
[28] Ibid., May, 1918, pp. 1106–7.

Department of Agriculture estimated that 40,000 farm workers had been attracted across our northern border by inducements of liberal pay and good working conditions.[29]

The task of tapping new sources of farm laborers was approached from many angles. Perhaps the largest source of additional help was the youth of this country, particularly the group aged 16–21, too young for the draft, yet old enough to do much necessary unskilled farm labor. This force was organized in the United States Boys Working Reserve. Every boy enrolled for farm work had to pass a physical examination and have the written consent of his parents or guardian.[30] These boys were recruited from high school and college classes, boy scout troops, community welfare organizations, and similar sources. Organized with semi-military discipline under leaders provided by the YMCA and other cooperating groups, the boys were taken into the country or to villages in areas needing additional workers and sent out to meet the farmers' demand.[31] Often the boys were first sent to training camps to learn the rudiments of farm work. Experience soon showed that under proper leadership such boys could be of vast help. They were usually paid by the farmers and the leaders always sought to get their charges a fair return for their labor.[32] More than 150,000 city boys worked on farms during 1917,[33] and in 1918 over 250,000 boys were mobilized for this work.[34] As regards the 1918 activity, the Secretary of Labor reported,

"In many instances where special crops were jeopardized by the lack of adequate labor to harvest them, they were saved through the prompt assistance of the boys recruited by the reserve. Such was the case in Michigan, with regard to the sugar-beet crop, where a large part of the planting would have had to be plowed under had it not been for the timely assistance of the reserve boys. In Georgia reserve boys saved by their sole efforts a valuable apple crop; across the continent in Oregon they helped to save the berry crop. In California a similar invaluable assistance was rendered by the organization in harvesting the immense acreage of fruit crops, including cherries, apricots, plums, and grapes."[35]

To attract urban male laborers to the fields, various expedients

[29] Wilcox, op. cit., p. 38.
[30] United States boys' working reserve, Monthly Review of the Bureau of Labor Statistics, June, 1917, p. 992.
[31] Wilcox, op. cit., pp. 47–48.
[32] Helen D. Fischer, The boys, the war, and the harrow, Survey, March 30, 1918, pp. 704–706. Also cf. Grantham, op. cit., pp. 215–216.
[33] U. S. Employment Service Bulletin, May 28, 1918, p. 3.
[34] Stoddard, op. cit., p. 1245.
[35] Annual Report of the Secretary of Labor, 1918–19, pp. 272–273.

were used. In hundreds of American communities, all business was shut down at times of peak labor needs and the city folk went out to the fields to gather the crops.[36] Under what became known as the "Connecticut Plan" employers pledged themselves to release their workers for farm work when they were needed. Those sent to the fields received their regular salaries from their employers, who were partly recompensed by being paid the wages farmers would otherwise have given the workers.[37] College students, government employees, and other urban people were urged to take their vacations working in the country, thus serving their country and gaining healthful exercise. Special efforts were made to get ex-farm hands and retired farmers to return to agricultural work for the duration of the war at least.[38] In the aggregate, these urbanites helped considerably in meeting farm labor needs.

Women, too, came to help with our crops. The Women's Land Army of America was formed in 1917 and organized camps at which women were trained in farm work and sent out to help cultivate and harvest. In 1918 this organization's 15,000 members served farmers in 30 states and proved themselves very useful. A physician's certificate of fitness was required from these volunteers and the work day was restricted to eight hours. The Army paid each girl $15 a month plus board, lodging, working costume, and laundry. Farmers paid the organization $2 a day or 25¢ an hour for each girl working.[39]

Another type of attack is illustrated by the Ohio efforts where chief reliance was placed upon education and propaganda. Thus advertisements were spread pointing out that the real income of a married farm hand getting $45 a month in cash was equivalent to that of the city dweller earning $115 monthly, while similar comparisons were shown for unmarried workers.[40]

Compulsory work laws were enacted in 12 states during the war period, mostly for the purpose of forcing idlers to go to work, usually in agriculture.[41] There is little indication that these laws resulted in the availability of much additional labor.

[36] Report of the Acting Chief of the Office of Farm Management in Annual Reports of the Department of Agriculture for the year ending June 30, 1918, p. 492.
[37] U. S. Employment Service Bulletin, April 30, 1918, p. 1.
[38] Ibid., May 28, 1918, p. 1 ff.
[39] Ibid., Oct. 15, 1918, p. 4. Wilcox, op. cit., p. 42, and New York Times, Sept. 22, 1918, III, p. 8.
[40] Leiserson, op. cit., p. 788.
[41] Compulsory work laws in the U. S., Monthly Labor Review, Dec., 1918, p. 1811.

Importation of foreigners was a relatively minor source of workers during the conflict. The contract labor, head tax, and literacy test provisions of the immigration law were suspended in favor of Mexican aliens coming to the United States for agricultural work, and several thousands came in for this purpose during 1918. About 700 Negroes were brought in from the Bahama Islands and worked for truck farmers on the east coast of Florida.[42]

The lessons of 1917–1918 seem clear. During wartime the crops of this nation can be cultivated and harvested even with a reduced work force. Increased mechanization can be used to decrease labor needs. Appropriate farm wages and improved working conditions made possible by higher farm prices can help keep workers on the farms. Proper organization of the labor market will permit more efficient utilization of the available labor supply as well as the mobilization of urban workers of all types to meet peak labor needs. With the cooperation of the Army, farm workers with experience can be kept in the fields where their efforts can be most valuable.

The relevance of this history to the present situation seems clear. It was possible in 1917–1918 to build up an organization out of nothing, and to mobilize the necessary manpower for agriculture. The lesson learned then was that hysteria and wild clamors of "labor shortage" were worse than useless to secure sufficient labor and employ it most efficiently. The task of recruitment must be handled scientifically if we wish to achieve the production goals set by Secretary Wickard. Fortunately the existing organization and personnel of the Department of Agriculture and the National Employment Service have had experience, and can draw upon the lessons of 1917–1918 for guidance. It is upon these agencies that much of the responsibility for winning the "Food for Victory" campaign must rest.

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[42] Annual report of the Commissioner General of Immigration, Washington, 1919, pp. 12–13.

NUTRITIONAL SCIENCE AND AGRICULTURAL POLICY

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IT IS SIGNIFICANT that there is such widespread interest in nutrition today. Good human nutrition has a real war meaning and purpose. It is a goal, an objective for man and society. In the attainment of any broad human goal like nutrition, conservation, prosperity, or well-being, a whole set of disciplines and sciences comes into play. Therefore nutrition is a broader field than biochemistry, home economics, or preventive medicine. It is rooted in both the biological and social sciences.

Scientific agricultural training and public service in the field of agriculture provide the broadest kind of background for scientific thinking in those fields where biology and society meet. Such training deals with the basic economics of food and fiber production. It offers a working knowledge of biochemistry. It deals with the sociological sciences of how people live and why they do what they do. In these fields we now have much of the knowledge necessary to improve greatly if not assure the third great freedom—freedom from want throughout the world.

Certain definite, observable changes in modern culture are taking place as a result of scientific knowledge. Those most striking, for instance, are perhaps in such fields as transportation, communication, and sanitation. Science and technology change our culture and thereby the habits of the individual.

One of the great observable changes as a result of science is in the field of human food. *We are in a period in which our food habits are shifting from those based on prescientific folklore and local environment and natural foods to diets based upon scientific nutritional standards.*

This cultural change is taking place at a rapid rate. Naturally those working in the various fields of food use and consumption are most aware of it. This is true whether one is engaged in meal preparation for the family, for the public, or in related health and welfare work. Such a cultural change has great implications for agriculture, and agricultural economists should, therefore, keep informed as to the latest developments in the nutrition field.

Most of the students of my generation who took elementary

courses in economics found the subject divided into production, exchange, distribution, and consumption. To me production was much more tangible than consumption. I am indebted to Dr. John B. Canning for pointing out to me that Alfred Marshall[1] in the preface to the Principles of Economics wrote: "The mecca of the economist lies in economic biology rather than in economic dynamics."

When this was written, the modern science of nutrition did not exist.

"Recourse to the indexed items," comments Dr. Canning, "will disclose that the 'economic biology' Marshall had in mind had nothing to do with the biology of man and the primary economic needs proceeding therefrom."

This economic biology of man which is the mecca of the economist becomes very important when it reaches the point of having a specific scientific basis. It can then set up definite goals of consumption to which the productive resources can be adjusted. If you really accept this with all its implications you set an entirely new course for the ship of agricultural economics and policy.

The nutritional relationship of the biological and economic sciences has a precedent set for it in the field of sanitation. With the wide acceptance of the germ theory of disease and its relationship to health has come a sense of public responsibility for sanitation. We now accept the idea that it is the duty of society to protect its members from infectious disease caused by lack of sanitation. By the same token *may we not be at the beginning of an epoch where it becomes the duty of society, as a matter of public health and welfare, to see to it that all its members get a diet that squares with scientific standards?*

If the logic of this is accepted, then there will have to be much that is new in the fields of agricultural policies, as they relate to the economics of both production and distribution; and sanitation sets a precedent.

Nutritional Science and the Progress of Man

Tremendous progress has been made in the field of biological and nutritional science. From some of the earliest studies in nutrition,

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[1] Alfred Marshall, Principles of economics, an introductory volume. 871 pp. London, Macmillan, 1920. P. xiv.

made by Lavoisier as early as the eighteenth century[2] nutrition has now become one of the leading players on the stage called life. It has become a developing pattern in modern civilization.

The three points in the progress of nutritional research that stand out clearly today are:

(1) Mankind has been presented with a rapidly accumulating amount of knowledge that comes from biochemistry and physiology and that points to great possibilities for the future of the human race if intelligently applied. This body of science is growing rapidly.

(2) Human nutrition and nutrition in many mammalian farm animals are closely related. Though there are variations in reaction in different species, knowledge about biochemistry obtained from studies among animals has been of immeasurable benefit in its application to man. Since animal nutrition is one of the basic foundations of scientific agriculture, it is relatively easy for scientifically trained people in our colleges of agriculture to grasp the significance of human nutrition.

(3) Researches have been undertaken which extend into the fields of hormones, enzymes, vitamins, rare minerals, and the complicated biochemical phenomena in the human being. Though much remains to be understood in this complicated field, *there is reason to believe that nutrition has a great deal to do with the phenomena of life, longevity, and the general physical, mental, and spiritual well-being of human beings.*

What has been the effect of these developments in science on our standards of living and our cultural patterns? Richard Osborn Cummings[3] answers this question in these words: "The science of nutrition may be said to have advanced to the point where it is firmly established not only as a branch of preventive medicine but as a major *instrument of social policy.*"

A Widened Scope of Agricultural Research

Agriculturists naturally are impressed by the fact that much of the progress in nutritional research came in the field of animal nutrition. Had it not been for the work in the agricultural experiment stations and in such branches of the Department of Agricul-

[2] Estelle E. Hawley, and Grace Carden. The art and science of nutrition; a textbook on the theory and application of nutrition. 619 pp., illus. St. Louis, The C. V. Mosby Co. 1941.

[3] Richard Osborn Cummings. The American and his food. 267 pp. Chicago, The University of Chicago Press. 1940.

ture as the Bureau of Home Economics, the Bureaus of Animal Industry, Plant Industry, Dairy Industry, Chemistry and Engineering, and private organizations and groups which endowed some of the researches in animal nutrition, progress would have been slower. To mention a few names that come to mind, we think of Armsby of Pennsylvania State College, Hart, Steenbock and Elvehjem of Wisconsin, McCollum of Wisconsin and Johns Hopkins, Maynard of Cornell. These and many others have contributed much toward the advancement of nutritional science.

For example, important research work on human nutrition is being carried on by the Public Health Service, the Bureau of Home Economics and other bureaus of the Department of Agriculture, as well as a number of research laboratories in the various research institutions of this country.

Recently there passed over my desk a summary of the projects being carried on under the Adams, the Purnell, and the Bankhead-Jones Acts, granting moneys to the Office of Experiment Stations and the experiment stations of various States cooperating under these acts. An effort is made under these provisions to avoid duplications and to relate the work being done at one station with different investigations in the same field at other stations. On animal nutrition the report gave approximately 363 active projects. On human nutrition there were 51 active projects. This, of course, is aside from all the other private researches being carried on in the medical schools, hospitals, and similar institutions in the country.

Nutrition, Health, and Vitality

A great advance in human nutrition took place when medical research began to show positively that improper food and malnutrition caused disease, and lack of proper functioning of the human organism. Medical science now attributes certain definite diseases to nutritional deficiencies. It has much basis for inferring that there is a great "subclinical" zone, as it is called, in which the human organism does not exhibit positive disease but in which there is such reduction of the natural muscular and nervous vitality that there is susceptibility to all sorts of disease, lack of vigor, and ill health. Surgeon General Thomas Parran, Jr., of the Public Health Service, has displayed great scientific statesmanship in seeing human nutrition as a most important public health matter. He thinks that we are at about the same place in understanding the

health implications of human nutrition today as we were in relation to bacteria half a century ago. More than this, he sees the need for intimate collaboration between agricultural and public health agencies in matters of nutritional policy. The fine cooperative relation between the United States Public Health Service and the United States Department of Agriculture are very significant.

Nutritional Standards

An important recent development is the establishment of standards for human nutrition approved by leading nutritional scientists and offered to the public as a guide. The first of international significance was the statement on the standards of nutrition agreed upon after consulting experts, by the Technical Commission of the League of Nations Health Committee.[4] The latest scientific dietary standard requirements given out in this country are those recommended by the Committee on Food and Nutrition of the National Research Council at the time of the National Nutrition Conference held in Washington, D. C., last May.[5] These standards have been widely publicized in connection with the great amount of nutrition education now being disseminated by Government and private agencies and by the schools, colleges, and health workers in all parts of the country. The setting of these standards marks the point in the development of nutritional science where responsible bodies of scientists have agreed that certain food elements are essential for the proper functioning of the human body. This really means the beginning of a new epoch in consumption, economics, and human welfare. It is something tangible upon which goals can be based.

Soil, Diet, and Health

As the result of earlier studies by Beeson[6] and others, researches have now been started to learn more about the interrelationship between soil, the food grown on different soils, diet, and the chemistry of the animal and human body. This research has begun at

[4] Report on the physiological bases of nutrition, Ser. L.o.N.P. 1936. II.B.4, 27 pp. See also The relation of agriculture to health, agriculture, and economic policy: final report of the Mixed Committee of the League of Nations, Ser. L.o.N.P. 1937. II.A.10, 327 pp.

[5] Recommended dietary allowances, Committee on Food and Nutrition, National Research Council. 5 pp. May, 1941.

[6] Kenneth C. Beeson. The mineral composition of crops with particular reference to the soils in which they were grown, a review and compilation, U. S. Dept. of Agr. Misc. Pub. 369, 164 pp. 1941.

Cornell University, the School of Nutrition, with Dr. L. A. Maynard at the head.

Hunger of primitive man was different from the kind of hunger suffered by most people in the present age. Primitive man lived in the open air. Hunger for him meant an empty stomach. But he also lived close to the soil, and in the course of his food-getting more than likely he ate plants and animal tissues and blood through which he received minerals more directly from the soil than does modern man.

Some, like Dr. H. A. Morgan, of the Tennessee Valley Authority, would hold that soil is the starting point of good nutrition. Though the knowledge which the soil people have on this subject to date represent only the extreme cases, evidence has been produced which relates soil deficiencies to the lack of physical and mental vigor of the people living on the soil, or eating food produced on such soil. There are areas in the world where human or animal foods, or both, are inadequate because the soils lack calcium, phosphorus, sulphur, iodine, copper, iron, or cobalt in forms available to plants. In a recent study on the mineral composition of crops with reference to the different soils on which they were grown, as reported in the United States Department of Agriculture Miscellaneous Publication No. 369, the following wide ranges in mineral content were found:

Three hundred and one samples of alfalfa varied in calcium content from a minimum of 0.59 per cent to a maximum of 4.15, which was 7 times the minimum amount; 238 samples of turnip roots showed a variation in phosphorus content of 0.06 per cent to 0.79, or 13 times the content of the low sample; 67 samples of cabbage varied in iron content from 11 parts per million to 305 parts per million, more than 27 times as much for the high sample; 30 samples of celery showed a range in copper content from 2 parts per million to 560 per million, which means that one sample of celery had 280 times more copper than that having the least amount; 35 samples of carrots showed a variation in iodine content ranging all the way from 2 parts per million to 2,400 parts per million, the high sample having 1,200 times as much iodine as the low sample.

More is known about the relationship of the soil to the mineral content of food than its relationship to the vitamin content of food. The availability of boron in the soil, for instance, has a pronounced effect on the quantity of vitamin A in plants. Several elements, especially

manganese, have a great pronounced effect on vitamin C in plants. After more facts of this kind have been made available, it may turn out that the vitamin content of plants is influenced by soil as much as is their mineral content. Soil scientists caution us that it is not a matter of straight-line relationship, but a question of balance between the elements in the soil. It is interesting to observe that medical research leaders who are working on the relationship between vitamins and mineral content to the health and welfare and vigor of the human being also stress the importance of balance between the various vitamins and elements.

This emphasis on balance, both by soil scientists and nutritional and medical men, tells us that while science can improve on nature, it cannot substitute for nature. Even fertile soils, poorly managed, may not provide good foods for those who occupy the land. Variations in the selection of diets, or poor selection of foods that go into the diet, may also definitely influence the nutritional welfare of families living on good land.

In speaking of the possibilities of the new researches at Cornell, E. C. Auchter, Chief of the Bureau of Plant Industry and Administrator of Agricultural Research of the United States Department of Agriculture, says;

> If there were areas in which these elements were deficient, what happens to the human beings who eat those plants, or who eat the animals that fed on those plants? The products of the animals that eat those plants are short on those things we need in our human nutrition and health program. We are making a study of the soil areas in this country. This is a careful study to locate the areas that are deficient in certain elements. The problem then is how to correct the deficiencies—whether through fertilizer, spraying, irrigation water, or by what means. That problem will be worked out as fast as we can get to it.[7]

Plant Breeding and Nutrition

Because of the importance of vitamins in food, nutritional science extends also into the field of genetics. In researches on plant breeding, evidence is accumulating that some varieties of vegetables are much higher in vitamin content than others and that even within the same variety wide variations exist.

For example, seven varieties of strawberries grown at the North

[7] E. C. Auchter, Research in the nutritional values of fruits and vegetables. An address delivered before the National Defense Gardening Conference, Washington, D. C., December 20, 1941.

Carolina Experiment Station, under identical conditions, showed variations in ascorbic acid (Vitamin C) ranging from 36.2 milligrams per 100 grams in the case of one of the older varieties to as high as 64.8 milligrams in the case of newly introduced hybrids. Variations from sample to sample within a variety were also evident.

Among 30 varieties and strains of cabbage grown under similar conditions in the gardens at Ohio State University, the ascorbic acid content ranged from 48 milligrams for Allhead Select to 181 milligrams for Midseason Market.

Similar findings are resulting from tests for other vitamins. Take the chili pepper—an excellent source of vitamin A. For many peoples in our Southwestern States and Mexico "chili" is probably the chief source of A. Recently the New Mexico station tested three varieties in the green stage of maturity. A variety known as No. 9 was found to contain 810 micrograms of carotene, whereas the Anaheim variety showed only 520, and a small paprika type only 350.

At the Washington Experiment Station, values in vitamin A in fresh peas were found a range from 600 international units per 100 grams for Telephone variety to 1,600 units for Dwarf Alderman. None of the processes in freezing these peas appeared to alter their vitamin A content.[8]

Researches of Dr. L. H. Newman, Agronomist of the Canadian Department of Agriculture, Dr. C. H. Bailey, of the Minnesota Experiment Station, the Division of Cereal Crops and Diseases of the Bureau of Plant Industry, United States Department of Agriculture, and research laboratories of milling companies are showing that there is great variability in the B complex of wheat. To what extent this is genetic or environmental is not known. But, in terms of nutritional value, we are beginning to see that there is a lot of difference in wheat.

These and numerous other experiments that might be mentioned are somewhat preliminary, it is true. They illustrate, however, that there is variability; and they point to the time when we shall know more of the reasons for this variability and the genetic and other factors that influence it. The genetic side of the nutritional quality of food is just emerging.

[8] Home resources for defense. Reprint from Report on the Agricultural Experiment Stations. U. S. Dept. Agr. 1940.

It is too early to see just what effect nutritional science will have on soil technology and fertilizer practices, on plant and animal breeding, and on animal feeding. I suspect that we may look forward to some important changes in farm practices coming from this source in a decade or so.

Food Technology and Farming

An important line of research which may have a definite bearing on the future of our agriculture is going on in the field of food technology. There is coming into prominence a kind of profession that might well be called food engineering. It recognizes the importance of vitamins, minerals, and the protective qualities of foods. Growth in this field indicates increasing recognition by food processors that, in order to retain the nutritional quality provided in food by nature, steps must be taken by the processor to retain the highest degree of nutritional quality in the food that goes to the consumer. This offers the possibility of important new foods becoming available for human nutrition, particularly soybean flour, peanut flour, dried skim milk, long extraction flour, and the like.

Agricultural scientists may also have to find ways to grade food in the market place on the basis of nutritional quality. In this they will need the wholehearted cooperation of agricultural economists and marketing officials as well. The problem includes prevention of deterioration in fresh vegetables. Changes in the vitamin content of vegetables between the time they are harvested and the time they are eaten may have a pronounced effect on their nutritional value. *Consideration of this point may profoundly affect the future of distribution and marketing.*

Time does not permit a discussion, on this occasion, of the bread problem and the recommendations for the enrichment of bread made by the National Research Council.

There is no doubt as to the evidence that the diets of many people are deficient in the B complex. The enrichment of white bread, as recommended by the National Research Council, is necessary as a war dietary measure.

Some have suggested that nutritional research points toward the enrichment of a large number of foods—particularly those of low vitamin and mineral content—with synthetic vitamins and minerals as a possibility in the future. Nutritional scientists are rather skeptical as to this. With the exception of white bread and perhaps

a few other foods, they now recommend getting the vitamins and minerals in the natural foods. As a matter of general principle they believe vitamins as medicine should be administered by doctors, and foods should not be used as conveyors of medicine.

Food Habits

This paper, so far, has dealt largely with the biological side of nutrition where a number of biological disciplines are involved and in which developments are taking place at a rapid rate. Let us now turn to the social sciences.

Up to the present, food habits and patterns of food consumption have received little or no attention from the sociologists, and some from the home economists. Dr. Hazel Stiebeling's studies are perhaps the most representative so far. A checkup on the social surveys by rural sociologists in rural communities shows but little on food habits. Although there are some excellent studies of standards of living, there has been but little on the food ways of people and on the why's and wherefore's of food preferences and habits. This is of great importance.

For example, a study in an eastern city disclosed a large number of low-income families that did not avail themselves of milk when it was offered free. Why? Because they or their children did not like milk.

Fifty per cent of farm families in a prosperous rural Ohio township, in a good dairy section, were below standard in milk consumption by the children. Why? Because it was not in the habit structure of the family.

Dr. Richard O. Cummings, in his book, The American and His Food, and Dr. J. C. Drummond of the University of London, now a member of the British Food Ministry, in his book, The Englishman's Food[9] have presented the cultural historical side in an interesting manner. Studies in this field by students of culture such as rural sociologists, cultural anthropologists, social psychologists, and home economists are very important.

Dietary Levels, Planning, and Agricultural Programs

One of the major developments in the field of agricultural policy making, in which nutritional science played a leading part, was the

[9] J. C. Drummond, and Anna Wilbraham, The Englishman's Food, 574 pp., illus. London and Toronto, Jonathan Cape Ltd. 1939.

establishment of agricultural production goals in connection with the farm programs, commencing in 1936, and especially those under the food-for-freedom goals established for 1942.

In 1934, Dr. Hazel Stiebeling of the Bureau of Home Economics of the Department of Agriculture worked out recommendations for four diets at different levels of nutritive content and cost. She applied the science of nutrition in such a way as to relate it to income, and worked out a low-cost diet, two moderate-cost diets, and a liberal diet. These were suggested as yardsticks against which actual diets could be measured. This study deservedly attracted a great deal of attention. It was a study of great significance.

The method introduced by Dr. Stiebeling marks a milepost in the history of nutrition. She translated calories, grams, and units of vitamin measurement into so much milk, eggs, meat, vegetables, and other foods which people had to have to be adequately fed. She bridged the gap of uncertainty between production and consumption. Here was a new device for the agricultural economist to take hold of.

In 1935 H. R. Tolley and F. F. Elliott, in the Program Planning Division of the Agricultural Adjustment Administration, organized a planning study which was carried on cooperatively with all Land Grant Colleges, State extension services and experiment stations, and some of the departmental agencies. They endeavored to interpret the dietary requirements worked out by Dr. Stiebeling in terms of crop acreages and number of livestock as national goals and in terms of regional adjustment in agricultural production. The work indicated that the growing of crops that would give our 130,000,000 people adequate diets would require some significant shifts in agricultural production. Specifically, major increases in the production of leafy, green, and yellow vegetables and in dairy production were indicated.

At the same time, Secretary Wallace, Tolley, and others in the Department were interested in revising the acreage control or adjustment programs in such a way as to encourage conservation. The shifts in production needed from the dietary standpoint worked in very well with the conservation objective, and further emphasized the advantages of shifting away from the surplus crops toward a better balanced agriculture. This work and this line of thought have continued in the planning and development of the farm programs administered by the Department. The work is centered in

the underlying philosophy of the Mount Weather agreement in relation to State and local agricultural planning. We are still a long way from achieving the volume and distribution of the protective foods necessary to give all our people the nutritionally ideal diet. But the planning and administrative staff of the Department and the Land Grant Colleges are keenly aware of the needs in this field, and they are among the major reasons for, or forces behind, Secretary Wickard's current production-goals or food-for-freedom program.

Meanwhile, the work which Stiebeling and Tolley started is being continued in their respecitve fields. Dr. Stiebeling and her associates are working out a series of new diets based upon information derived from the study of consumers' purchases and the nutritional standard released by the National Research Council. At the same time, the suggested diets are being worked out in terms of acreages and numbers of livestock in the Bureau of Agricultural Economics. The Bureau, and other interested agencies in the Department, are also engaged in a general study, under the leadership of R. C. Smith and F. V. Waugh, of ways in which such surplus disposal and distribution programs as the stamp plan, the school lunch program, and other approaches might be used to assure a better-fed Nation and increase the demand for the agricultural commodities which we use for food.

The Stamp Plan which, in its initial stages was so ably administered and successfully put under way by Milo Perkins, and the School Lunch Program in which the Surplus Marketing Administration, the Works Progress Administration, and the Extension Service cooperate, are representative of the ultimate stage of the Ever-Normal Granary plan envisioned by Vice President Wallace when he was Secretary of Agriculture. Here practical application of the Ever-Normal Granary to the field of mass consumption and public welfare is made possible.

It is interesting to note that there has been a shift—or perhaps something new—in public opinion in the attitude of people toward the kind of program like the Stamp Plan and the School Lunch Program. There is a widespread acceptance of the idea that low-income people should be well fed as a health measure—at public expense if necessary. A recent reliable survey of opinion on this subject discloses that 70 per cent of city people favor plans for subsidization of food purchases such as that embodied in the stamp

plan; 10 per cent are undecided; only 20 per cent are opposed. Among farm people, 82 per cent approved.

Conservation and Agricultural Policy

The planning and formulation of agricultural programs under the dietary needs and agricultural adjustment principle of conservation means conservation in the broadest sense. Here we think of conservation not merely as preventing erosion. We apply the yardstick of what food is needed for people to be well fed. We apply the yardstick of what crops will best yield the food to accomplish this and what soils will best raise these crops. To use these yardsticks with accuracy we need standards. Nutritional science now provides us with these standards and offers the starting point from which agricultural planning can be conducted on a truly scientific basis.

A wise conservation policy, such as that underlying the principles embodied in the planning of crops on the basis of dietary needs represents a great cultural change taking place, in that dietary standards are based on science and agricultural production standards are based more and more on what adequate dietary standards require. It represents an advance along the lines of rational consumer demand instead of letting price adjust production.

If the trend just described is as positive as it appears to be at the present time, it will have a tremendous effect upon agricultural policy. It therefore behooves agricultural economists to have a working knowledge of the outlines of nutrition and of this newer food phenomenon. Science gives the agricultural economists a much more definite starting point on which to base production and consumption policies than we have ever had before.

Nutrition and War

Nutritional science now has a front rank in the war policies of all nations. Aside from its application in our Army and Navy, nutrition has been recognized in this country as one of the major war activities. All war activities of governmental agencies having to do with nutrition have been placed under the Office of Defense Health and Welfare Services with Mr. Paul V. McNutt, Administrator of the Federal Security, in charge. In the States this work is under the State nutrition committees, which keep in close liaison with the Office of Defense Health and Welfare Services. County nutrition committees have been set up as part of the State and county councils of defense.

This integration of the war efforts of all agencies dealing with nutrition is an important step. While the administrative status of the various agencies is not affected, their nutritional war efforts are being dovetailed closely for maximum effectiveness. Thus we have for instance, the cooperation of 9,000 professionally trained extension workers and the 700,000 responsible farm men and women who, as volunteers, stand behind the extension organization in the different States and communities. Ten thousand Smith-Huges high schools in vocational agriculture and home economics are taking part in the nutrition program. So is the 4-H Club organization of 1,500,000 boys and girls. So also are such great organizations as the American Red Cross, members of the medical and dental associations, hospital dietitians, public health and welfare workers.

In this second World War we have a changed food emphasis from that witnessed in the first World War. In 1917 and 1918 the emphasis was on conservation and substitution of food needed for war purposes. In this war the emphasis is on the strength and stamina that come to a people when all of them have the proper food. The great coordinated educational effort of the Nutrition Program, made on behalf of Defense and Victory, should go a long way toward having people recognize the principles of scientific nutrition. It offers a real opportunity in the application of the recommendations made at the National Nutrition Conference held in Washington last May. If these recommendations will be carried through in the stress of the war period ahead, we may foresee permanent dietary shifts in the direction of the protective foods.

The International Aspects of Planning Production to Meet Nutrition Needs

It is conceivable to plan agricultural production along the lines suggested so long as we stay within national boundaries.

As soon as we attempt to apply it on an international basis, however, this matter becomes very complicated. No one has attempted to do on a world basis what the program planning people, both State and Federal, did under H. R. Tolley's leadership in 1935 and in connection with the 1942 goals. Though this was talked about at two meetings of the International Conference of Agricultural Economists,[10] no concrete plans for action or research have

[10] Proceedings of the International Conference of Agricultural Economists, Fourth Conference, 1936. 528 pp. London, Oxford University Press.

so far been made. The Health Section of the League of Nations, and the International Institute of Agriculture at Rome, were both interested in the problem and might have been working on it now had not the war intervened. Something in an international way may develop among the nations of the Western Hemisphere.

Yet it appears that with the end of achieving international stability after the war and of working out a more permanent peace, the welfare of the people concerned, especially their welfare from the standpoint of nutrition and having enough of the right food to eat, should become the basis of any peace resulting from the present conflict.

The practical question naturally arises: If we were able to apply the nutritional standards recommended by the League of Nations, and the more *recently recommended standards of the National Research Council made public* at the time of the National Nutrition Conference, how could we use this knowledge to bring about a more humane world and perhaps permanent peace?

As man learns to understand himself better, we may hope that he will be able to apply this new science to himself, and to regulate science so as to benefit mankind. Nutritional science is providing a way whereby reality can be substituted for mythology and superstition. As far as the human being is concerned, much can be done to give him better health, greater happiness, and longevity. As we learn to know more about the nutritional needs of man we ought also to be able to find out ways of giving him a better environment in the other aspects of life.

Nutrition and Lasting Peace

Not long ago Sir John Orr of Scotland spoke to a group of workers in the Department of Agriculture and Public Health Service. Sir John is a leading man of agricultural and nutritional science in Britain. He pointed to the great progress in nutrition in the British Isles prior to the war. He said that in the past 20 years the British have really made remarkable contributions in increasing the stature and health of a large percentage of the children in industrial areas through greater use of milk and the protective foods. It is to maintain insofar as possible what has been accomplished in this respect that Britain has appealed to us for the high-protein products—eggs, milk, cheese, and meat.

Despite the many accomplishments in the nutritional field in

Britain, Sir John stated that universal post-war application of the American food standards, as announced by the National Research Council at the time of the President's Nutrition Conference, would mean a revolution in British farming practices. It was Sir John's hope that in the post-war world nations would formulate their food policies on the basis of human needs rather than on the basis of tariff walls or narrow geographic boundaries. Such policies, he said, would make for a more prosperous agriculture and for greater health and happiness of all people.

Sir John is not alone in these beliefs. Perhaps the more practical world will say that he is too much of an idealist. But ideals are what we need if we want to attain the lasting peace which all mankind craves today. Sir John's ideas should at least be given some serious consideration in the post war planning in which agricultural economists will be engaged in the months and years that lie ahead.

Looking Ahead

In summary and conclusion it may be in order to indulge in a little speculation, a little prophecy, and a little philosophy.

Adequate human nutrition in scientific terms is in process of becoming a definite goal or objective in society. It is now more definite and objective than many other elements in human welfare. In order that we may work toward this goal, there must be a close relationship between the biological and social sciences, particularly in agriculture. A number of disciplines need to have close working relationship with each other.

In this connection Cornell University has set a new pattern. Mr. H. E. Babcock, chairman of the Board of Trustees of Cornell University, is to no small degree responsible for the organization of the new school of nutrition. The school is to have a 5-year course and tie together physiology, biochemistry, soil, plant, and animal nutrition, home economics as it relates to food preparation, agricultural economics in the field of production and marketing. The last year is to be given by the School of Medicine, supplemented by applied dietectics and hospital work in New York City. Such schools and like activities will have a great influence—through the processes of college and extension teaching and research—in changing the attitudes of the American people in relation to food and its influence on health and well-being.

There is a prospect that one of the social effects of the war will be

to focus attention on the requirements of a good diet. Agricultural economists and agricultural policy makers should be studying the impact of widespread acceptance of nutritional science in agriculture, in the same manner that they have studied other trends such as mechanization, international trade, and the like. This new approach requires a lot of new thinking.

How can we keep the food supply adjusted to patterns of consumption based on scientific nutritional standards? Where are the large supplies of milk and dairy products to come from in the future? How is the price mechanism to operate so as to give the flow of the right kinds of foods in the proportion demanded? A central question of the future is:

Should the Government subsidize the production of the protective foods so that the price will stimulate their consumption? England has embarked on this policy, and milk is on the way to becoming a free food to all growing children, particularly in the low-income group.

We need much in the way of regional and type-of-farming studies in relation to nutrition which do in a regional way what Dr. Stiebeling has done in a national way. As a basis for planning we need to know by type of city and by region what the food habits are, what the present diets are, and how best the situation can be improved.

Food will play an important role in the new peace. What can be done now to apply on a hemispheric and world basis the principles that we are discussing on a national basis? In the field of distribution and merchandising there must be change and adjustment. New ways must be found to adjust the source of supply to the income levels of different groups.

It is hoped that the workers in the field of agriculture, both in the natural and social sciences, can and will keep at the forefront of these developments.

We need somehow in our land-grant college courses a basic course that might be called an integrated science of man, a course that will bring together the outstanding threads of the various sciences relating to man, so that the student will get an integrated view in terms of current science of just what kind of creature man is. What does genetics say about him? What about man biochemically? What is the nature of him as an organism? What is known about his mental and nervous processes? What is the nature of his culture? How has his culture evolved over the hundreds of thou-

sands of years that man has been man? A few institutions are experimenting with such courses. They are very important for the future. As science gives an integrated picture of the nature of man, we can if we so will, adjust man's environment so as to give him better opportunities to realize himself.

It looks as though we are emerging on an enterprise of adjusting man's food environment along the lines of what science says it should be. If we succeed in this it should be easier to adjust man's environment in other ways as well.

One of the hopes of man in this dismal world is to be found in appraising the social values of science in a philosophical form of scientific humanism by which we can interpret and direct man's struggle into higher values and to a Christian culture. By taking what he knows in biological and physiological science, and by adjusting his cultural environment to the somewhat rigid rules of these sciences, man may eventually hope to make more out of himself and his progeny than he has done so far.

TOWARD A MORE ADEQUATE APPROACH TO THE FARM TENURE PROGRAM*

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OUR SOCIETY, which prizes personal liberty as one of its indisputable-values, has organized the economic realm as a profit-and-loss or reward-and-penalty economy, built around the optimum of decentralization and private initiative. It is the highly complex and advanced institution of private property, which promotes the self-adjusting economic distribution of productive resources with a minimum of centralized political interference. However, since the welfare of the nation involves a continuous conflict between the individual and society as a whole as to their respective rights and duties, the center of emphasis fluctuates between the poles of individual freedom and social discipline, and any solution must always be a compromise. In early stages of development, society finds that such corrections and alterations require more initiative than comprehension of the ramifications thereof. But as a society matures to more highly organized stages, it becomes more and more difficult to make changes without shaking the whole foundation. Yet if these reforms are not made as they become necessary, they accumulate. Their postponement inhibits social and economic adjustment and generates resentment, political friction, and social dynamite. Eventually such delay of needed reforms leads to the major surgical operations on the body politic which we call revolutions—the most brutal, clumsy, and costly of all forms of adjustment. Invariably they constitute irrefutable evidence that the pre-revolutionary leaders lacked the insight and the wisdom to reform the institutions of society and to develop them organically. In studying the history of the world's bloodiest revolutions up to this day, I find that inhibited, delayed, or otherwise frustrated reforms of land-tenure systems were the most powerful factors responsible.

Land tenure forms the core of institutional agricultural policy. Its perspective is therefore that of the longest run. It certainly poses agricultural policy's most central problems, and probably its most vital ones. Politically and legally it is a tenacious matter,

* Special acknowledgment is due to J. S. Davis and Harry Creech for valuable suggestions.

offering stubborn resistance to adjustments. Anchored in the constitutional and basic law of the land, land-tenure institutions often last through many generations virtually unchanged.

The philosophy and the ethics of our democratic society demand the widest opportunities for individual social advancement. This means that our essentially liberal economy must be capable of continuous evolution and expansion. It seems logical that the zeal and pressure for reform will be most active whenever these processes are at their lowest ebb. The more our system expands as the population continues to grow, the less even very considerable functional defects in land-tenure institutions will be felt, particularly because the agricultural segment of our society is bound to shrink as long as we succed in increasing the social product.

Recently we have passed from a period of prolonged depression to one of expansion and full employment. In the 'twenties there was little pressure toward land-tenure reforms. After the debacle of 1929, and especially since 1932, agriculture had become a second line of defense in an embattled society whose philosophy inclined toward stabilization rather than expansion, and a conscience more social than economic. Land-tenure reform became then the focus of many public efforts toward agriculture.

The 'thirties have made a most valuable contribution to land-tenure policy by clarifying the issues, largely indirectly, and by proving empirically that short cut methods of government intervention cannot accomplish the desired reforms. Today the pressure in the direction of revisions of land tenure has diminished. While the expansive period lasts—and this may be many years—public interest will turn away from the land-tenure problem, to swing back to it powerfully when another period of regression or gestation begins. If we search for the real meaning or spiritual equivalent of the pains and hardships of such pauses in evolution, we can find it only in contemplation and re-examination of the moral basis of our institutions, and in measuring their appropriateness or obsolescence. Advantageously, political pressure and urgency of administrative action have been released from the reform of land tenure. The complexity and scope of the problem defy high-pressure attack. For the present, our entire western world and all its institutions are under the most frightful assault. If our way of living is to prevail, we can win it only on the fields of battle. But when we have attained victory, we must make our society economically

more dynamic and socially more just than any other. Hence it would be most regrettable indeed if the subject were to be shelved completely until we face another emergency.

In discussing appropriate policies, it seems obligatory to arrive at some agreement concerning the aims at which we are striving. What does our society expect from ideal land-tenure institutions? I venture to propose a general formula for this aim;

Our land-tenure institutions should promote the maximization of the sustained social net product from agricultural pursuits in such a way that an optimum of professional creativeness as well as individual freedom and security for the population can be attained. Land-tenure institutions must therefore keep open the opportunity for continuous and gradual shifting of land and capital resources into the control of brains and hands most competent to utilize them. In the conflict between maximization of the social product and social security, tenure institutions must compromise without blocking progress.

If such a general line of national policy were accepted, it would exclude a number of solutions which are proposed from time to time and have been adopted temporarily, at least, in some countries. It would exclude, for instance, all the measures attempting to give absolute protection to the possession of land resources, such as the German Hereditary Homestead Act of 1933. Any static concept of a body of farmers who are removed from the severity of the profit-and-loss economy excludes itself, because it ignores the necessity of keepting the gainfully employed body of active farmers and the participating members of their families functionally fit. As soon as we halt the process of promotion and elimination within the limits of fair standards, we are faced with the only alternative—replacing the automatism by arbitrary political action. In Russia, Italy, and Germany, the farmer is relieved of the supposedly cruel automatism of bankruptcy and foreclosure, but he is subject to the regimentation and political dictate of an authoritarian bureaucracy which can remove him from ownership, management, or labor on farms.

If we realize that the ultimate general aims of our institutional land-tenure policy are made up of tendencies conflicting in detail, we are aware that at best only compromise solutions, with greater or lesser relative merits, can be attained. Hence simply to harp on defects of the existing tenure system or to orient our criticism to Utopian expectations is completely beside the point. We really

need to put into one scale the most widely considered alternative system, and into the other the existing setup, each with all its merits and shortcomings. For such comparative and complex study we have no satisfactory method; yet it is the great challenge.

Fortunately, widespread public debate, the research efforts of social scientists, lawyers, governmental and private agencies, the hearings before Congress, the bills introduced and acts passed, plus the administrative action of our government during the 'thirties, all have clarified the situation as to the type and magnitude of ailments and complaints. With the report of the President's Committee on Farm Tenancy, with widely scattered fact-finding documents and published results of special research, with reports of the concerned public agencies, and with the proceedings of the American Farm Economic Association, the Rural Sociological Society, and the American Society of Farm Managers and Rural Appraisers, as evidence of dominant public opinion, we can summarize as follows without identifying ourselves with all the complaints:

1. A considerable proportion of American farm owners have insufficient security because of too high encumbrance and/or too poor land.
2. The proportion of farms operated by tenants is undesirably large, particularly since up to 1935 the trend showed a further growth of the tenancy segment.
3. A large proportion of existing farm tenancy does not offer the people who actually till the land a fair opportunity to earn an adequate agricultural income, while it also prevents them from attaining security of tenure for more than a single year.
4. The defects of the existing system of land tenure, especially in its tenancy and cropper aspects, are largely responsible for soil erosion and depletion, and for immense social waste, due to lack of interest of either party to keep or to ameliorate durable improvements.
5. Owing to absence of written leases and to year-to-year terms, a large proportion of tenants and share croppers moves every year. This instability erodes the rural community as well as the welfare of the youth in these farm families.
6. The existing land-tenure system fails to offer the young and the poor sufficient opportunity to climb the social ladder and ultimately to own land.
7. Farm labor has low income and no security, because it is exempt from the benefits granted to industrial labor, such as social security benefits, minimum hours, and minimum wages. The backflow of city people to the farm, backing up of surplus population on farms, and excessive migration depress farm income and conditions below subsistence levels.

All these complaints of the evils of our tenure system differ in substance and intensity with the region of the country. They can be lumped together as complaints of wasteful utilization of human and land resources and lack of security.

Of specific complaints about the arrangements and functional performance of tenure institutions, a considerable list has been assembled. Absence of written leases or share-cropper contracts, and absence of standard forms for contracts based on fair distribution of rights and duties between both parties, absence of terms longer than year to year, tendency to compel tenants to cash-crop production and to prohibit livestock farming in combination with crops, lack of provision for compensation for unexhausted improvements and for disturbance, lack of workable arbitration clauses, and absence of reasonable insurance against bodily injury for farm laborers—all these loom large.

The first phase of federal land-tenure reform policies was part and parcel of the initial attack against rural poverty and distress under Mr. Tugwell and his Resettlement Administration. With all the élan and fervor that inspired the first Roosevelt Administration, a thorough correction of the existing pattern of land use and land distribution was contemplated. The actual approach was immediate and direct. By purchase of uninhabited submarginal land, and simultaneous purchase of good reclaimable or reclaimed land, and by resettling the people, with effective persuasion, supervision, public credit, and advice, in good houses on better land, the great shift was to be made at the economic and social fringe. Without previous experience, with tremendous pressure and haste, with more enthusiasm than recognition of the host of most tenacious and closely intertwined problems, this initial phase turned into an endless chain of blunders, some of which I have personally observed on the spot. It is greatly to the credit of our agricultural administration (the greatest enterprise in public administration of all time) that without much pressure from the public, the misconception of the approach and its innumerable weaknesses were quickly realized, the total loss written off as cost of newly acquired experience, and the program and staff reorganized. Inconspicuously the Resettlement Administration disappeared from the front of agricultural reform. Its successor, the much less ambitious and more competent Farm Security Administration, took the lead in farm-tenure policies.

The Farm Security Administration proceeded to carry out a program of action outlined in February 1937, in a report by a joint technical committee of the President's Special Farm Tenancy Committee and the National Resources Committee. That report (prepared by L. C. Gray, John D. Black, E. G. Nourse, A. G. Black, Charles S. Johnson, Lowry Nelson, W. W. Alexander, and M. W. Thatcher) fully recognized the complexity of the ailments to be dealt with, and proposed a multiangular co-ordinated system of action. The authors said little about the time element involved in the reform policies, but obviously thought much more in terms of the long consistent pull and gradual conquest of the specific evils of a system of land tenure than they did in terms of accomplishments in a four-year period between national elections. Moreover, they stressed the point that a program to ameliorate land-tenure conditions could become effective only insofar as it is embedded in an agricultural policy that is well integrated with the general economic policy of the nation.

Recommendations were made for federal action, for state action, and for co-operative action between federal and state governments. Among the types suggested for federal action, the central part concerned the shifting of tenants into ownership and aid to encumbered owners for protection against loss of the farms. Other proposals concerned rural rehabilitation by financial aid beyond that of the Farm Credit Administration; care of migrants and other farm laborers in experiments with sanitary government camps, co-operative farms and other farms; retirement of 5 million acres of submarginal land from farming at a cost of $4 per acre; and discouragement of land speculation and ownership by nonfarmers. For state action, improvement in landlord tenancy relations and in lease contracts, differential taxation of farm lands, and protection of civil liberties were proposed. Finally, improvement of land leases and of educational and health services for farm labor and tenants were recommended for federal-state action.

This document of 1937 undoubtedly stands out as a milestone on our way toward land-tenure reforms. Today, almost five years later, we can review what happened to the recommendations set forth.

The authors can well be satisfied with the early results. The record of the Farm Security Administration is in no sense sensational, but a very impressive and respectable service to the welfare

of our rural society is being rendered, in a spirit that has not lost initiative as grasp of the problems and judgment about feasible action have matured, and as resistance to unwarranted optimism became hardened by accruing experience.

The major part of the activity of the Farm Security Administration has been absorbed by financial aid and consultation to needy farm families. Through 1940 a total of 286,000 needy families had received rehabilitation loans. In 17 western states, 1,400 families had received water-facility loans. The debts of 128,000 farm families were adjusted by 23 per cent, while the debts of 14,500 families were reduced by 65 per cent. In addition, many grants-in-aid were made to victims of disaster or calamity.

In part the energies of the Farm Security Administration have been devoted to the administration of 164 homestead projects—legacies of the Resettlement Administration and its early forerunner, the Subsistence Homestead Division of the Department of the Interior, and other agencies. This program has not been expanded, but the FSA is trying to make the best of it in behalf of the rehabilitation of needy families.

The Farm Security Administration has also undertaken to make owners out of farm tenants under the Bankhead-Jones Act of 1937. In the four years ending June 30, 1941, nearly 21,000 tenants had purchased farms with 122 million dollars of 40-year mortgages at 3 per cent interest and 1.3 per cent amortization. Plans for this fiscal year call for 9,000 new tenant-purchase loans out of the annual 50 million dollar appropriation under the act. The Director of the Tenant Purchase Division[1] envisages a reduction in the number of farm tenants in the United States from about 2,330,000 to about 1,000,000 by converting tenants into owners during the next 40 or 50 years at the rate of about 30,000 net per year on the average. The Tenant Farm Purchase program belongs to the self-liquidating projects. The repayment record is exceptionally favorable. The public bears only the losses incurred plus some 5 million dollars annual subsidy for administrative costs. One can hardly object that such costs are prohibitive. Moreover, the transfer of title from the landlords and their mortgages to the government is only a transitional step, for the tenants will gradually acquire the equity which is now in the hands of their landlords and thereafter in the

[1] Paul V. Maris, National land tenure objectives, Land Policy Review, 4: 53. July, 1941.

hands of the Farm Security Administration or its creditor, the Reconstruction Finance Corporation.

Another part of the federal program which also deals with improvements of land tenure has been persistently pursued. Since 1935 the tenure-improvement section of the Farm Security Administration has prepared model lease forms for various types of arrangements including share cropping. It also has organized co-operation of all federal, state, and local agencies concerned in the education of landlords and tenants, and toward the adoption of improved leases. In 1939, in the course of the administrative reorganization of the Department of Agriculture, this work was transferred to the Division of Land Economics and the Division of State and Local Planning in the Bureau of Agricultural Economics. It became more and more apparent that many public agencies other than the Farmer Security Administration were concerned with the tenure problem, among them the AAA, the Farm Credit Administration, the Soil Conservation Service, the Forest Service, the Extension Service, and the System of Vocational Education. In 1939 an Interbureau Co-ordinating Committee on Farm Tenure began to function. It has issued Department of Agriculture lease forms and educational materials, and has drafted a program for co-operation of the various agencies in their efforts to improve the contractual arrangements between landlords and tenants.[2]

As I see it, this unsensational but relentless work in the direction of voluntary adoption of more intelligently designed contracts which, while being impartially fair to both parties, use the motive of mutual profit for improvements in land utilization and income, is the most promising of all the federal action so far. It appears to me even much more valuable than the tenant-purchase program, because it affects an incomparably larger proportion of all contracts, and slowly changes customs and tacitly operative standards of fairness in the right direction.

A comparison of the accomplishments of four years of administrative endeavors with the recommendations of the President's Committee reveals the interesting fact that some ideas contained in the Committee's report have borne good fruit, while others, such as the purchase of submarginal land and the resettlement of farmers from submarginal land, have more or less faded out.

[2] The foregoing rests largely upon information given through the courtesy of Mr. Dover P. Trent, Principal Agricultural Economist, Division of State and Local Planning. November 25, 1941.

On the other hand, the four-year national account shows more than just the results of efforts on the part of the federal government. Very considerable progress has been made in several states, in general agreement with the policy recommended by the President's Committee.

My time allotment prohibits any attempt at even the most condensed digest of the developments in Iowa, which has led in resourceful research on land tenure, or of progress made in Illinois, or the initiative taken in Oklahoma and Texas. These states have, as Joseph Ackermann recently reported,[3] made great headway in clarifying the issues, and have passed special land-tenure-reform legislation. Other states, including Arkansas, Kentucky, Missouri, and South Carolina, have dealt with the problem in various ways, in part reconnoitering, educating, and promoting better understanding, and also by preparing legislative bills.

From this bird's-eye view of the major achievements and the essence of the evolution of thought concerning land-tenure reform, it may be seen that invaluable progress has been made. On the one hand, the respect for the almost endless ramifications of changes in the tenure institutions, and for rational but cryptic economic forces behind the drift into more tenancy, has grown as research proceeded. On the other hand, the means of policy which promise the greatest leverage have also become clearer. The address delivered by the economist in charge of the Division of Land Economics in the Bureau of Agricultural Economics[4] before the Farm Economic Association in December 1940, as well as four other papers presented on tenure problems at New Orleans, are impressive documents which support my opinion regarding the great progress made in orientation and preliminary research. The effect of the Tenant Purchase program is insignificant at least in volume. Indeed, it remains so far within the margin of the statistical error in counting tenants. The status of farm tenants is essentially what it was, except for improvements in Iowa and perhaps in one or two other states, and for the clients of the Farm Security Administration. If within five or six years we should experience frightful frictions of a major postwar depression, it will be little consolation that the

[3] Joseph Ackermann, What some of our states are doing in farm tenure improvement, Journal of the American Society of Farm Managers and Rural Appraisers, 5: 123–133. October, 1941.

[4] M. M. Kelso, Needed research in farm tenancy, JOUR. FARM ECON., 23: 291–303. February, 1941.

Bankhead-Jones Tenant Farm Purchase Act is expected to yield major adjustments 30 years hence. It may well be that while we are making owners out of tenants at the rate of 9,000 a year, owners by their own initiative are becoming tenants at a rate five or ten times as high. It must also be pointed out that there is no safety in the assumption that the tenant-purchase program can proceed cumulatively as if everything else remained the same.

Nevertheless, it would be contrary to the solid experiences of other countries which have struggled with tenure reform for generations if, in the scanty space of four years, we had proceeded farther toward the distant goal. Considering the obstacles, the progress is very impressive. Yet it would be a lack of realism for us to conceal from ourselves the fact that, measured by the aims and scope of needed reform the actual accomplishment shrinks to almost insignificant proportions.

For our purpose, as is so often the case in discussing policies, it is sobering to glance at statistics. The report of the Administrator of the Farm Security Administration for 1940 (page 2) asserts that tenants and share croppers have been increasing at the rate of 40,000 families a year. When this report was written, the 1940 census data were not yet available. When they were published, they told a different story. During the decade 1930–40, the number of full owners increased 6 per cent; part owners decreased 6 per cent; and all owners increased 5 per cent. Tenants proper, excluding share croppers, decreased 11 per cent, or by 330,000. Share croppers decreased 30 per cent, or by 235,000, most of them continuing about as they did before but now properly called laborers. The actual shifts revealed by the census statistics are contrary to the assumptions of the Farm Security Administration, and probably have been ever since 1935 or before the Farm Security Administration existed.

These data supply valuable material for shaping the strategy of our reform policies. They illustrate how the grand total of economic decisions and adjustments of millions of independent individuals almost unnoticeably and with the greatest of ease accomplishes the most powerful adjustments, far beyond the possible effect of the most resourceful governmental intervention. While with great toil and expense the Farm Security Administration has assisted 20,000 tenants in four years to become owners, a multiple of that number became owners by their own initiative without public assistance and the number of tenants proper, excluding share croppers,

dropped by 330,000 within five years. The lesson, as I read it, is that relatively moderate institutional adjustments will alter the powerful sway of forces of private initiative sufficiently to bring about the desirable shifts in proportion and performance.

In view of this fascinating interruption if not reversal of a supposedly iron secular trend, it may be worthwhile to reconsider the main alternatives for the best strategy of tenure reform, and the arsenal of methods that can be put into service. The problem as such is neither new nor specifically American, and the discussion, brainwork, and experience of other nations can profitably be consulted.

As a first alternative of institutional changes rather than state intervention by administrative action, we may consider a policy that, by sheer economic gravitation, induces more and more farmers to acquire ownership. We could try to lift the owners into such preferential status that by competition alone farmers would drift away from tenancy to ownership. If this were the last word of statesmanship and wisdom, we should and could go to work and adopt effective methods toward that end. One of them would be farm legislation to improve the income and working conditions of hired wage hands. As a result, the labor return for the families of owner-operators and tenants would rise in competition with large-scale hired-labor enterprises. It would probably lead to greater mechanization of family units and reduce the relative profitability of the plantation and other large-scale units. The advantage would be an improvement in the status of retained farm laborers, both hired wage hands and croppers. At the same time the volume of employment of such labor would be reduced. The labor force set free would be in the labor market to be absorbed by nonagricultural employment—which is, by the way, a necessary process for reducing poverty. On tenant-operated farms, landlords would share the improved income of family farms by higher rents, while owner-operators would gain this for themselves.

Another instrument for creating an economic slope toward increasing owner-operation lies in the field of tax policies. Shifting the tax burden from the general property tax toward income taxes would necessarily put a heavier burden on landlords than on tenants or owner-operators. If landlords should shift the burden to tenants, the result would still be the squeeze toward owner-operation. Evasion into manager-operation, which landlords might seek,

would be less attractive if the aforementioned labor legislation had taken some of the profit out of it. Similar tax leverage could be applied by establishing a deductible earned-income credit for operating resident owners. Owners as well as tenants would benefit from it, but the landlord or the absentee owner would not have it. If the landlord should try to shift the tax burden by raising the rent, it would increase the differential rent of the owner-operator.

Several states, like Louisiana and Mississippi, have in recent years introduced homestead exemption from property taxes up to the maximum assessed value of the farm. This is not discriminatory since it is open to everyone, but the small farmer benefits from it disproportionately more. It is true that all tax exemptions have the disadvantage that they, in the long run, tend to raise the value of the property which usually, through paying off co-heirs and through sales, leads in turn to greater encumbrance. Yet the net effect of homestead exemption is an incentive given to operating farmers to own their farms.

Another type of tax that could be used to make it profitable for landlord to sell out to tenants consists of speculative capital-gains taxes. They would apply essentially to foreclosed land held by mortgagees like insurance companies and leased to tenants for the sake of recovering losses. Such taxes may have some of the desired effect. Similarly, one can create an economic slope toward expansion of owner-operation through an adaptation of credit policies.

It is well known in this country and Europe[5] that, as tenants, farmers have access to more land or better land with the same amount of owned capital than they do as owners. The economic reason is that as tenants they have a personally interested partner who provides the capital in more generous fashion, because he can better appraise the risk and protect himself by supervision and cooperation in management with the tenant, while a centralized institution providing mortgage credit has neither such influence nor opportunity. Technically it is not inconceivable to make more such capital available to owner-operators.[1] However, very unpleasant and inescapable other effects accompany any such measure. One could think of establishing through the Federal Land Banks longer terms of mortgages with either flexible amortization or even flat loans. It would also be possible to reduce the interest

[5] Cf. Theodore Schultz, Capital rationing, uncertainty, and farm tenancy reform, Journal of Political Economy, 48: 309–324. June, 1940.

rate and to liberalize the limit of mortgage grants in proportion to the appraised value. To be sure, with such changes we would get all the undesired effects as well. No private capital could be lured to such risky ventures without public subsidy and underwriting of the additional risk. However, other effects are much more aggravating. The more we liberalize the rationing of foreign capital for farm owners, the more we expose them to insecurity. Long terms, low interest, and flexible or no amortization reduce the danger of delinquency in depression, but even minor changes in land values will wipe out the equity and safety margin for the mortgagee if the limit of encumbrance is substantially raised. Any such policy leads to the otherwise undesirable byproducts of public control of interest rates and a shift toward more and more governmental financing of farm mortgage credit, and toward the adoption of personal credit features into mortgage credit.

However, even if the differential in capital rationing which favors the tenant could be diminished or eliminated entirely, in the eyes of many competent and well-to-do farmers tenancy would still retain the attractive feature that it does not tie the farmer too tightly to the investment of all his capital in a specific farm. Although we have liberalized our loans to urban home owners so far that in any part of the country a person with an income can start house ownership with a token of savings or without any, millions of people with income and considerable savings still prefer to live in rented homes or apartments. Nobody has ever suggested that we try to make farm owners as mobile as are tenants, and to free owners from the various sorts of risk of investment in land to the extent that tenants are free from them. Liberalization of mortgage loans would work toward that end, because the smaller the owner's equity the more easily he may desert it.

Politically it might be much more expedient to use special benefits such as established under the Agricultural Adjustment Administration and Soil Conservation policies for the purpose of making outright ownership of family farms more profitable. While the courts are hesitant to uphold discriminatory taxes—at least in principle—they have been much more susceptible to lenient interpretation of the constitutionality of subsidy and benefit payments.

This whole approach of giving the owner-operators sufficient advantages to let them roll up the front of tenancy includes many

single measures which are worthy of serious consideration, independent of the major decision as to whether the emphasis of reform shall or shall not rest upon it. Its greatest weakness lies in the fact that, after tenancy is to a certain extent reduced, the remaining proportion of tenancy will be progressively resistent against further shrinkage. Competition for leases would increase, and the lot of tenants thereby would be worse than before. In other words, the tenants, as the weakest party in the market, will bear the brunt of the pressure under this strategy of reducing the tenancy segment which may take many decades. We would purchase more ownership at the price of greater misery for the remaining tenants and unintentionally subsidize the landlords.

The alternative strategy would do quite the opposite—namely, tackle tenure reform from the lower brackets of tenure: those of tenancy and labor. It has its foundation in a different philosophy concerning land tenure. Instead of proclaiming that the owner-operated family type farm is the backbone of an independent rural middle class and the ideal for which to strive, one assumes that more social stability, greater productivity must be promoted by institutional adjustments in every form of tenure. Such adjustments can be made without any government interference but by changing, reaffirming, and reinterpreting the rules of the game of free enterprise. Such reform would involve federal and supplementary state legislation by which compensation for unexhausted improvements and for unwarranted termination of the lease so-called "disturbance" is issued to the tenant, as well as compensation for the neglect of improvements and other damage granted to the landlord. Automatic renewal, greater freedom of management for the tenant, and a legal procedure for consent or agreement to facilitate durable improvements belong in such legislation, as does a simple, competent, quick, and inexpensive system of mediation and arbitration by elected farmer mediation and arbitration boards composed equally of landlords and tenants. We must leave it, of course, to competent lawyers to determine the proper legislative strategy in line with the constitution and its interpretation by the Supreme Court in order to pave the way to the proposed reforms. What we are concerned with is the clarification of the aims and the institutions set up of the reform.

Such legislation must reinterpret the farm lease. Instead of being

looked upon as a strictly contractual relation between two individuals without any moral or other obligation save their free will to agree, the lease should be considered a contract which represents simultaneously the interest of the commonwealth and that of two equal parties co-operating toward the optimal use of all resources available to them for the common goal of creating the maximum sustained income.[6] Such reinterpretation is a decisive step toward shifting the strategy of reform from punitive or social aid measures in a class struggle to that of objective economics of welfare.

This solution is completely in line with a sound concept of a free and expanding economy founded on ethical principles and social discipline. If the profit motive is a propelling force, it is incomprehensible why we should not be able to arrange for a minimum legal standard of penalty and reward for both parties so that it becomes a paying proposition to do what is mutually in their interests and society's. It is not, as Spiegel[7] assumes, Pigou's original contribution to interpret farm-tenancy reforms in strictly economic terms. In fact, it is the great wisdom of English tenancy legislation that, during a long and bitter struggle for reforms, strictly economic thought has prevailed throughout and reform legislation has been kept free from even the slightest tinge of charity and social relief, with the result that the supposedly inherent evils of tenancy have more or less disappeared.

In order to keep such legal reform clearly within the realm of economics, it is essential to avoid public fixing of rents. Experience in Ireland and Germany supplies ample evidence that political log-rolling enters to complicate the tenancy problem as soon as the determination of rents in the free market is interfered with. It is equally undesirable to open the doors to ready revision of rents, because as with liberalization of divorce laws, it leads to lowering of the morale of the contracting parties. Tenants will offer high rents in bad faith in order to defeat other bidders, anticipating reduction by arbitration. Landlords will offer low rents to wealthy tenants, expecting to jack them up by arbitration.

If sufficiently thorough compulsory reforms put a more solid and elevated floor under farm leases, it is virtually inevitable that more security and better income for both parties will ensue. This

[6] Cf. Karl Brandt, The English system of regulating landlord tenant relations, Journal of the American Society of Farm Managers and Rural Appraisers, 2: 3–14. April, 1938.

[7] Henry W. Spiegel, Land tenure policies (Chapel Hill, 1941), pp. 68–69.

will also work toward greater stability of occupancy by tenants, and landlords will probably improve their capital assets and their long-term revenues.

If this happens, there is little reason for the nation to continue to worry about the persistence of the large proportion of farm tenancy, since it would perform as well as owner-operation. If we really believe in freedom, we should let the tillers of the soil choose what they want, provided they can choose between good property deeds and good leases. It is, however, possible that the adjustment in the balance of rights and duties of both parties may lead to a regression of tenancy because the landlords may want to sell out. Then the question would be whether family farmers would buy or whether large-scale operators would take their place. This latter alternative could be blocked by farm labor legislation, which is desirable for the very reasons that make land tenure reform in general urgent.

In this connection it cannot be repeated too often that share croppers without capital and the right of management are laborers. I agree with Dr. T. Lynn Smith's statement that there are few things as ridiculous as classing the cropper as a tenant and hence as a farm operator.[8] The application of labor legislation to share cropping will do much greater justice to the croppers, most of whom are either incapable or unwilling to shoulder the responsibilities of a managing tenant.

It must be realized, however, that such legislation would have a different impact upon the various regions and types of tenancy in this country, which range all the way from contracts with option to buy to others which cover little else but an employer-laborer relationship. That part of farm tenancy in the United States which functions so smoothly that it does not offer any problems, as is the case for a large part of farm leases in the north central and northeastern states, would not be affected at all. In Minnesota, for example, approximately 30 per cent of all tenants are related to the landlords, three-fourths of these being sons and sons-in-law.[9] For family tenancy among relatives, reform laws would be irrelevant. Similarly, the relations of those landlords and tenants who are cooperating in harmony, and in general the elite of progressive landlords and competent entrepreneur-tenants would remain untouched.

[8] T. Lynn Smith, Tenure problems and research needs, JOUR. FARM ECON., 19: 143–147. February, 1937.

[9] George A. Pond, Farm tenancy in Minnesota, Minnesota Agr. Exp. Sta. Bull. 353, June, 1941, p. 54.

According to European experience the most competent large scale landlords would have no objection against improvements at the bottom of tenancy. Individual absentee landlords would be most vulnerable and might sell out, while mortgage banks which have leased land formerly foreclosed might make the necessary adjustments to conform with the law. Such reform legislation would probably improve the standards and the competence of the body of tenants.

If landlords sell out, they will be bound to grant unusually high mortgages and small down payments, whereby they can boost the sales price. But they have to take a greater risk because they lose the right to co-operate in management. If they do not proceed in that fashion, they are bound to sell at a lower price. Since the volume of capital available to tenants for purchase and owner-operation would not be large enough to absorb the land by purchase, it might well lead to an accumulation of large-scale enterprises. Again the answer would be labor legislation.

If tenants as well as landlords were organized, we might be much closer to a well-prepared and considerable reform legislation. Of course, a corrupt union bureaucracy striving for monopoly would be progress in reverse. Yet honest organizations which make the groups articulate, give legal advice, and explore the feasible legal adjustments could become the promoters of well-balanced reforms. In Germany organization of landlords and tenants has been most instrumental in bringing about a satisfactory tenant reform.

Reforms of the farm labor contract law are perhaps even more essential than those of farm tenancy. It is probably true that among farm labor, including the bulk of all share croppers, we have a residual in the labor market which is in part physically, mentally, genetically, and socially ill-fitted for greater efficiency and greater responsibility, while we must try to make the best of them in agriculture. I agree with Dr. Hoffsommer[10] that, like everybody else, the laborer wants to have control of his own affairs. Yet, as he realizes, this is something that can be granted in full by society only to those qualified, and as a reward for performance according to standards. Where would we be in industry, traffic, commerce, or science if we had insisted that everybody must have control of his

[10] Harold Hoffsommer, Progress of tenure groups, JOUR. FARM ECON., 23: 210. Feburary, 1941.

own affairs? Man is a social animal, and our society is one of co-operation.

So long as we believe in civil liberties we cannot and shall not prevent people from migrating to places of better opportunity. This is the way in which an expanding free economy functions and adjusts itself. But why should we allow fellow citizens to camp or to be camped in filth under slum conditions in the midst of a civilized commonwealth? Why should we allow the youth of migrating parents to be deprived of the only public service that creates equality of opportunity—namely, education? The prevention of that deplorable condition is not regimentation or socialism. It is little more than self-respecting and self-protecting common sense. Every year millions of Americans migrate during vacation time—the wealthy as well as the poor—to national parks and state forests; and we have found the way of keeping all camping grounds orderly, clean, and sanitary.

For the sake of sanitation we have introduced exceedingly high minimum requirements for housing, feeding, and medical control of dairy cows. Why, then, should we not adopt minimum standards for housing of farm laborers, minimum requirements of insurance against bodily injuries and fatal accidents as well as minimum wages, in all farms employing more than one hired farm hand? Minimum wages should not be looked upon as social relief, but as a stimulus to economic progress and elimination of the causes of underdog wages. The present juxtaposition of immensely improved employment conditions, representation, and income for all non-agricultural labor, and co-existent archaic conditions for farm labor, work toward the perpetuation of wasteful methods of work, lack of skill, insufficient tools and equipment. Minimum wages force the training of skilled farm labor. In the course of adjustments and shifts brought about by minimum wages, the greatest poverty will diminish as the competitive price economy has driven it back everywhere else. If in a period of transition a certain part of unskilled farm labor should become unemployable, it would be better to take them on relief rolls temporarily and give them vocational training during that period, than to leave them forever in the anachronistic status of would-be serfs. The real price that society pays for this residue from past centuries is the distortion of our land-tenure system. Moreover, we should not expect agriculture and the rural community to be forever the involuntary and anonymous relief

agency absorbing without pay a large amount of industrial unemployment.[11]

The following conclusions may sharpen the preceding discussion:

1. The exclusive orientation of tenure policies according to the ideal of ownership is bound to ignore the real economic and social aims. If the institution of farm tenancy is reformed and functions well, it can be left to the people whether they choose ownership or leasehold.

2. The effect of the Bankhead-Jones farm-purchase program on the land-tenure situation is negligible, in spite of its successful and competent administration. Continuation of the program seems desirable as a valuable experiment for further study.

3. The government's effort toward introduction of model leases is a most promising beginning and should be continued with greater vigor and more co-operation on the part of all agencies concerned. All available leverage through all public agencies should be used toward that end. Better education of landlords and tenants or more intelligent and mutually more beneficial contractual arrangements is still a field wide open for progress on the largest scale.

4. Most of the available measures to strengthen owner-operation and to expand it at the cost of tenancy are not feasible. Ownership with higher encumbrance does not offer the supposed greater security, and frequently leads to great sacrifices in income as well as greater risk.

5. In a dynamic society and an expanding economy, the supplementary institution of farm leases conforms to vital necessities of greater mobility and partnership in risk bearing. The advantage of having a decentralized class of private landlords, who are willing to lease all the fixed capital and take the full risk of changes in value of such capital, who have the important function of placing their resources in the hands of the most competent operator available, and who supplement the organizing and managing abilities of tenants, should not be underestimated. Any realizable substitution for this capital involves undesirable political, social, and economic effects.

6. A most promising reform is to be sought in the direction of compulsory legislative adjustments in the landlord-tenant relations, with the aim of establishing a minimum system of premiums and

[11] Roy F. Hendrickson, The farmer and the farmer's helper, Land Policy Review, 4: 38–48. July, 1941.

penalties for both parties for better performance in their mutual private financial interests and those of the national welfare, combined with provisions for automatic renewal and longer advance notice. Greater security of tenure and compensation for improvements promises to assimilate the functioning of tenancy to that of owner-operation, and to lead to longer occupancy, more conservationist husbandry, and improvement in durable land improvements. The social and professional standards of tenants will gradually be raised, while the skill of landlords in refining the lease arrangements will improve beyond fulfillment of the legal minimum. Eventually such reform may also lead to an expansion of ownership, although the importance of such change diminishes as tenancy improves.

7. Part and parcel of whatever reforms may be adopted for owner and/or tenant operation must be a reform of the existing anachronistic farm-labor system. Legislation similar to that for industrial labor, though more moderate in degree and adjusted in character to the particular farming conditions but comprising minimum housing requirements as well as minimum wages, is necessary as a stimulus for economic forces that will gradually ameliorate the worst conditions. All-out national defense efforts of American agriculture will make wage-floors for agricultural labor necessary as a stimulus to more efficient labor use and a protection against war profiteering. Farm-labor legislation will be the strongest safeguard against the undesirable shifts toward large-scale farming as a by-product of tenure reforms. Continuation of state and federal activity in behalf of camps for mobile farm labor is highly desirable.

8. Besides continually and tenaciously pursued, wisely shaped, and gradual land-tenure reforms, greater social security for the rural population must be promoted through a combination of policies which curtail violent fluctuations of land values and through alert readjustments with respect to taxes, amortization, and interest rates in severe depressions.

A tenure reform fused with the mellow wisdom of statesmanship cannot be, never has been, and never will be the brainchild of a few. In the tradition of progressive political democracy, it will represent the accumulated experience, hopes, and thoughts of our generation. Beyond that, it will reflect the wisdom of other nations and other historical eras.

THE CONTENT OF LAND ECONOMICS AND RESEARCH METHODS ADAPTED TO ITS NEEDS

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I. *The Content of the Field*

1. *The Problem of Definition*

CERTAIN prerequisite considerations must be stated concerning the demarcation of fields of science, else the task is plainly futile. In the first place, since all parts of the universe are somehow associated with all other parts, no segment of knowledge can be exclusive unto itself. Secondly, if the question is argued for purely budgetary purposes, the tendency will be to describe another's field so narrowly as to define it out of existence and to state one's own so broadly as to construct a slogan instead of a definition. Thirdly, since change is a pervasive aspect of life, we should not only accept the fact, but indeed expect that our knowledge and therefore our outlines of it will vary from time to time.

What purpose is to be served in defining and outlining a field of knowledge? The answer is founded on the proposition that knowledge must be relevant to action; that the essence of science is inquiry; and that the final objective of inquiry is better to equip ourselves to control the events of ordinary experience.[1] Scientific inquiry must ultimately be related to the solution of experienced problems;[2] its significance judged on the basis of its contribution to that solution; and its final test of validity set in the result obtained when the conclusions are put to test in purposive action.

A recognizable field of scientific knowledge must then be concerned with a type or group of intimately related problems. The materials of a field consist of the summarized account of problems faced, analytical tools devised, and insights gained in the solution of those problems in the past; and it is efficiently organized to the extent that it expedites the bringing of this accumulated knowledge to bear upon the unsolved problems of the present.

The content of a field of science consists of the problems to which the science turns its attention. A definition serves the purpose of

[1] This thesis is developed in John Dewey, Quest for certainty, Minton, Balch and Co., N. Y., 1929, and in his Logic; the theory of inquiry, Henry Holt and Co., N. Y., 1939.

[2] See below: Remarks on content.

stating the type of problems in the solution of which the subsumed materials may be expected to be helpful. It serves as a guide in deciding whether the field can be expected to have the best available information and technique to attack a proffered problem and if so, of serving as a general guide in the inquiry. The results of the inquiry add to the materials of the field and thus contribute to the further evolution of it.

A teacher of mine once said that a field of science includes that which is best done by men who are regarded as in that field. This quip has some merit, but as a starting point rather than as a final word. We must not only review the problems that have been subjects of land economics research, but also try to determine the strategic issues that tie the problems closer to other land economics work than to something else.

To keep our treatment in reasonable bounds, we must restrict it to the last four decades in this country,[3] remembering that the first published outline of the field was not made until 1916[4] and that not until 1919 was it christened "land economics" and outlined under that title.[5]

2. *Land Utilization*

The largest category of land economics is "land utilization" research. It dates from the last World War when the issue was, how can we best arrange for the bringing of unused lands into agricultural production?[6] In 1919, the committee on land economics included the topic, land utilization, to refer to studies of why some lands were not used and why some were misused, and a topic, land settlement, to refer to problems arising from the process of bringing land into farming units. Work on these topics resulted in the stellar contributions of Gray and Black in the cut-over, E. O. Wooten in grazing lands, and Teele in irrigation and reclamation settlement.[7]

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[3] Even so, the references to research reports are illustrative and not complete. Still, the footnotes are heavy, but necessary to keep the body of the paper brief. It is important to remember in using research reports that the date of publication is often less significant than the date of initiation of the research.

[4] R. T. Ely, Landed property as an economic concept and as a field of research, Amer. Econ. Rev., Sup., March, 1917.

[5] Report of the committee appointed by the Secretary of Agriculture to consider the subject of land economics. . . . , Circular 138, U.S.D.A. June, 1919.

[6] See the papers by B. H. Hibbard, W. J. Spillman and R. T. Ely in Amer. Econ. Rev., Sup., March, 1917.

[7] U.S.D.A. Bul. 1295 (1925); U.S.D.A. Bul. 1001 (1922); and U.S.D.A. Bul. 1257 (1924); R. P. Teele, Economics of land reclamation, Chicago, 1927.

The 1923 *Yearbook* report[8] indicated the sufficiency of our total land supply, and the need for careful attention to the process of converting unused or grazing lands into farms.[9] Before long, however, inquiries showed that agriculture was already over-expanded,[10] and experimental studies were initiated to study the process of the contraction of farming.[11] The most advanced of these was the Clayton and Peet inquiry in Vermont, which appeared under the significant title: "Land Utilization as a Basis for Rural Economic Organization."[12]

Even before some of this work was available, public programs were instituted to assist in shifting farm land into other uses. Because of the immediacy of these programs, attention had to be turned to the designation of specific lands to be taken out of farming, and various land classification and land use planning techniques were devised to present these judgments.[13]

Land utilization interest advanced, and a number of investigations were made of situations in which farming or grazing was in a stage of decline and abandonment, or in which unused land was being brought into farming. But there were also a few studies in the problems associated with types of changes not previously examined. Among these were the shifting of rural lands to uses associated with direct city requirements such as in recreation and rural residence[14] and to mineral uses.[15] Also there was some work in major land use changes on a national scale comparable to that of the 1923 report.[16]

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[8] Yearbook of Agriculture, U.S.D.A., 1923. Pp. 415–506.

[9] L. C. Gray, Land economics as a field of research, Amer. Econ. Rev., Sup., March, 1926; R. T. Ely, Research in land and public utility economics, Jour. Land and Public Utility Econ., Jan., 1925; P. S. Lovejoy, Theory and practise in land classification, ibid., April, 1925; L. C. Gray, The status of American research work in agricultural land economics, JOUR. FARM ECON., April, 1928.

[10] Wis. Agr. Expt. Sta. Bul. 406 (1929); Cornell Agr. Expt. Sta. Bul. 476 and 490 (1929).

[11] West Virginia, U.S.D.A. Tech. Bul. 289 (1932); Kentucky, U.S.D.A. Tech Bul. 303 (1932); Ohio Expt. Sta. Bul. 485 (1931); Pa. Expt. Sta. Bul. 257 (1930).

[12] Vermont Agr. Expt. Sta. Bul. 357 (1933). See: L. C. Gray, Round-table discussion: land economics, Amer. Econ. Rev., Sup., March, 1928 and op. cit., JOUR. FARM ECON., April, 1928; D. Weeks, Scope and methods of research in land utilization, JOUR. FARM ECON., Oct., 1929.

[13] See: Chas. Gooze, Progress in rural land classification in the U. S., Land Policy Circular, Sup., December, 1935; and Cornell Ag. Expt. Sta. Memoir 160 (1934).

[14] A number of recreation studies beginning with Wis. Agr. Expt. Sta. Bul. 422 (1932) and a number of part-time farming studies beginning with Mass. Agr. Expt. Sta. Bul. 266 (1930). See also: L. A. Salter, Jr. and L. F. Diehl, Part-time farming research, JOUR. FARM ECON., August, 1940.

[15] J. Salisbury, Jr. and L. A. Salter, Jr. Subsurface resources and surface land economics, Jour. of Land and Public Utility Econ., August and November, 1941.

[16] National Resources Board, Supplementary reports of the Land Planning

What is there in common among the apparently diverse situations towards which land utilization research has been directed? A careful review of the work reveals that they are all situations in which a process of shifting "major land uses" is strategic to the achievement of social well-being. The change may have stopped short of an acceptable adjustment or it may be going on at a rapid rate, but the problems arise out of the shifting from one pattern of major land uses to another.

This term "major land use" is most important, for land economists have long used it in describing land utilization work. The 1931 *Scope and Method Bulletin*, for example, states, "It is with the major rather than with the minor uses that land utilization analysis concerns itself."[17] What are these major uses? Traditionally, they include forestry, farming, grazing, recreation, mining, residence, wild life, commerce, industry, and we must add non-use.[18] What is the significance of a listing of "land uses" at this level? The point is that these types of activity are significantly different in the surface requirements of their operating units; that there can be but very little alteration as between these uses without involving a change in the characteristics of the surface-units of other proximate establishments.

The characteristics of a unit of surface are its physical resource qualities and its extension or locational relationship to other units, and the summation of these into landed property rights including the financial value associated with these rights. We are indebted to Professor Wehrwein for emphasizing that these significant factors are all brought into focus for the land economist in the surface unit.[19]

The list of major land use categories is properly a supple one, for our emphasis is not upon the terms, but upon the characteristics that make the level of the listing significant. For example, is "farming" a major use category? The need for recognizing types of farming for land utilization analyses is to be judged on the surface requirements of the types. If a shifting of types of farms can be ef-

Committee, I-XI, 1936–1938. Also, for a number of years there has been notable work in the urban field on the processes of shifting major land uses in city areas, as illustrated by the work of Rosalind Tough, Philip Cornick, and Helen Monchow.

[17] J. D. Black, ed. Research in agricultural land utilization. Social Science Research Council Bul. 2, 1931.

[18] In the physical sense.

[19] See his definition in R. T. Ely and G. S. Wehrwein, Land economics, N. Y., 1940, p. vi.

fected without altering the surface attributes of other proximate units, they are not on the order of major land use types. A great number of types that must be recognized for other kinds of inquiry may not be critical so far as land utilization research is concerned.[20]

It is not inferred that one only knows what a major use type is as the result of a land utilization study, but rather that a preliminary examination should early determine whether a major land use change is involved. For the efficient organization of the field, land economists should be evaluating various forms of activity in terms of their surface unit requirements. This material will usually be supplied by economists in farm, forest, housing, industrial, ranch or game management whose studies of the proportioning of all factors within operating units will reveal the surface requirements of these units.

The extent to which a land utilization inquiry appears to cover a small or large part of a total situation must depend upon the direct ramifications of shifts in the surface characteristics mentioned. For instance, land utilization studies usually include analyses of local government, for changes in the spatial extent of the surface units often mean immediate changes in the costs of government, while changes in the control and value of property rights in land imply direct changes in government revenue.

At present, land utilization research has dealt with the *problems arising from* processes of shifting major land uses, which may be grouped and characterized as:

Decadence and abandonment. (Active major uses to non-use.)
Initial settlement. (Non-use to active major use.)
Urbanization. (Suburbanization, rurbanization.) (Major rural uses to residential, recreational, watershed uses.)
Industrialization. (Rural uses to industrial or mineral uses.)
Consolidation and parcelization. (Changes in spatial requirements of existing major uses and interchanges between grazing and farming uses.)
Urban processes. (Blighting, expansion.)

Land utilization is the broadest sub-field in land economics. In a sense, the categories of land economics other than land utilization may be regarded as specialties; for while they are aimed at problems in which changes in major uses are not the immediate source of confusion, they deal with phases that always will form some part of a land utilization inquiry.

[20] A similar test must be used in urban problems where, for example, differentiation between heavy and light industry units is usually required and where even certain types within these categories must be recognized.

3. *Landed Property*

As has been indicated, the physical resource and extension attributes of a unit of the earth's surface are brought into human control through property rights.

When Ely first outlined the field that has since become "land economics," he used the phrase "landed property as a field of research."[21] Later when Spillman outlined the work of the Office of Farm Management in the field, he listed "property in land" as one major topic, and under it he included land values, land tenure, and land policies.[22]

Land tenure has been a subject of land economics research in this country since the turn of the century. Whereas we had hoped to develop a nation relatively free of feudal traces, we were confronted with the presence of an extensive tenancy, both urban and rural,[23] and a group of social scientists turned to the task of attempting to resolve the discordance.[24] As all work in rural social research expanded, a good deal if it concerned the problems arising out of changes in the control over property rights in farming units. This work varied in its scope. A number of studies made little attempt to study the causes of the change or to trace its effects beyond the management of farm units,[25] but others, like those of Wehrwein, Sanders, von Tungeln and Spillman, followed the causes and consequences of the process more fully.[26]

In the World War period of sky-rocketing farm prices a rapid turn-over in titles to farm land occurred, and tenure research shifted to the transfer of ownership rights.[27]

The phenomenal rise in land values raised questions as to the

[21] Supra., 4.

[22] Supra., 6.

[23] G. K. Holmes, Tenancy in the U. S., Quarterly Jour. of Econ., October, 1895. In view of some of our policies, it would seem that the revelation of the tenancy situation should not have been a shock. Yet it is very doubtful whether at the time these policies were formed, they were believed to be contrary to the ultimate free holding of the land.

[24] E.g.: H. C. Taylor, The decline of landowning farmers in England, U. of Wis., 1904; R. P. Brooks, The Agrarian revolution in Ga., U. of Wis., 1914; B. H. Hibbard, Farm tenancy in the U. S., Annals of the Amer. Acad. of Pol. and Social Sci., March, 1912; Holmes, op. cit.

[25] Wis. Ag. Exp. Sta. Bul. 198 (1910), Mo. Ag. Exp. Sta. Bul. 121 (1914), and Iowa Ag. Exp. Sta. Bul. 159 (1915), were among the earliest of these.

[26] U. of Texas Bul. 21 and 39 (1915); G. H. von Tungeln, The results of some rural social surveys in Iowa, Amer. Econ. Rev., Sup., March, 1917; U.S.D.A. Tech. Bul. 1068 (1922), Texas Ag. Exp. Sta. Bul. 278 (1921); W. J. Spillman, The agricultural ladder, Amer. Econ. Rev., Sup., March, 1919.

[27] H. A. Turner, Ownership of rented farms, U.S.D.A. Bul. 1432 and 1433 (1926).

nature of this phenomenon and its effect upon social well-being. Land values were listed as one of the main categories of land economics research by the 1919 committee, and the studies of Gray, Lloyd, Forster, and Chambers represent outstanding examples of such inquiry in the ensuing period.[28]

Land economics was deemphasized in rural social science in the middle twenties when interest in marketing and prices advanced rapidly;[29] but in line with the increased tempo in the cities, urban land economics was accented.[30] By the end of the decade, property owners in many areas were failing to pay taxes and there was a resulting trend of private property to outright public property in the farms. Studies of this process were initiated to try to bring order out of the conflict.[31] As a part of this problem, some of the studies dealt with methods of assessing property: work that has continued on since and which has also encompassed the appraisal of land for credit purposes.[32]

Coincidental with the outlook policy for farm programing and the availability of new techniques for research involving quantitative computation, studies were begun of historical land value trends and their statistical correlation with other observed series. This work was done in a number of states[33] and was put on a standard federal service basis.

A very noticeable recent trend has been a revival of interest in problems of farm tenure and tenancy. Much of the recent work traces the adjustments arising from a splitting of rights between owner and occupier only as far as their effects upon the management of the farm unit. There has been a number of appendices on the possibility of using legislative powers to correct these particular

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[28] U.S.D.A. Bul. 874 (1920); Ky. Ag. Exp. Sta. Bul. 240 (1922); U.S.D.A. Bul. 1224 (1924). It should be noted that studies in urban land values had been conducted even at an earlier date. See: G. B. L. Arner, Land values, in: R. T. Ely, et al., Urban Land Economics, Ann Arbor, 1922. Among recent studies: H. L. Hoyt, One Hundred Years of Land Values in Chicago. U. of Chicago Press, 1934.

[29] Cf. L. C. Gray, The evolution of the land program of the U.S.D.A., U.S.D.A., March 22, 1939, p. 9.

[30] R. T. Ely, et al., op. cit.; and H. B. Dorau and A. G. Hinman, Urban Land Economics, N. Y., 1924, were the earliest of a series on urban land and real estate.

[31] Wis. Ag. Exp. Sta. Bul. 399 (1929); and Minn. Ag. Exp. Sta. Bul. 277 (1931); Mass. Ag. Exp. Sta. Bul. 235 (1927) are some of the earlier of a long series.

[32] This type of work for urban land had been carried on by W. I. King as early as 1914 (The Valuation of Urban Realty for Purposes of Taxation, U. of Wis., 1914) but the only work in rural lands had been Haas' work at Minnesota (Minn. Ag. Exp. Sta. Tech. Bul. 9, 1922).

[33] Neb. Ag. Exp. Sta. Res. Bul. 72 (1934); Mo. Ag. Exp. Sta. Bul. 229 (1935); and Vt. Ag. Exp. Sta. Bul. 391 (1935) are examples.

consequences of the change in property control, and a series of separate summaries of the present legal framework of the landlord-tenant relation has appeared. Several studies serve to depict (geographically) facts of the tenure situation. In addition, there have been a few studies of the wider consequences of the trend in the tenancy status; a few general reports on the changes in farm owners; and some new attention to the ownership of forested lands.

We must emphasize briefly that studies specializing in the problems of land regulation and public land holding are an important part of the field. Most work in land regulation has been as a sideline in land utilization studies, and a very little has aimed at those problems in which public regulation of the land is the central factor causing confusion.

To gather up some pertinent threads from the research just reviewed, it should first be noted that all of these lines of inquiry have centered on those problems issuing from the distribution or passing of property rights in land. Further, either they have concerned situations in which there was no significant change in the major category of use, or they have dealt only with the property aspects of major land use changes.

Those aspects of human behavior in which the property rights in surface units are the dominant directing factor may be grouped *as problems arising from:*

Land exchange: the exchange of ownership rights.
  Land ownership: the owners among whom rights are exchanged.
  Land values: the level at which rights are exchanged.[34]
  Land transactions: the manner in which the exchange is conducted.[35]
Land tenure: the splitting of property rights.
  Tenancy: between owner and occupier.
  Land credit: between owner or occupier and financier.
  Title splitting: between various owners.
  Public property: between private owner and the public.
  Land taxation: the levying of taxes on private rights.
  Land regulation: the limitation of private rights.

4. *Location*

It has often been repeated that the fundamental attribute of land is extension, or the spatial extent and locational relationships of a land surface unit. It is obviously clear that the location of land has a vital bearing on property rights in it and upon the financial valua-

[34] Includes land valuation, the method of determining the level.
[35] Includes the market mechanism; title registration, etc.

tion of those rights, and that it is an integral aspect of all land utilization issues.

Certain land economics inquiries deal with those human problems in which the locational relationships of surface units are of dominant significance, or they specialize in the extension aspects of landed property or land utilization problems. The work done does not warrant an attempt to state the categories of problems which are important. Most of the work has been of the nature of preparing analytical concepts, and most of this has been done abroad,[36] or it has dealt with urban or manufacturing locational problems.[37]

In locational studies of other uses, physical resource requirements of the space occupied by the operating units are more likely to be equally critical, and thus the study tends to become a landed property or land utilization analysis. However, in a few cases, specialized studies have been made of the locational aspects of such uses.

5. Resources

The second basic characteristic of surface units is the physical resources to which access is given. We therefore list those problems in which the quality of physical resources is the strategic factor affecting social activity and those studies which specialize in the resource aspects of landed property or land utilization problems.

The most important topic is, of course, that of conservation economics, dealing specifically with those problems in which change in the physical resources of the space units occupied is the crucial factor in a given confused situation. This problem has received scant attention from economists, compared with the attention given it by physical scientists or with the amount of public programing for it.

Even the work of developing analytical concepts has been about limited to a few articles by Ely, Hess and Carver, Gray, Hammar, Hotelling, Bunce and Wantrup in this country.

Inquiry tracing the economic causes and consequences of disappearance of farm land resources has been so restricted to the effects

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[36] The work of von Thunen, Brinkman, Weber, and Christaller especially.

[37] Especially the work of Haig and Hoover in this country. (Note that in the conceptual work, resource qualities are usually abstracted out; in urban uses, resource qualities of the surface occupied are practically insignificant; and the physical resource association of manufacturing is a locational relation to the extractive operating units.)

on farm management as to attract even the criticism of those specializing in farm management problems.[38] The studies of the land economists in the flood control program, it is hoped, may result in some additional insight into the broader ramifications of resource disappearance. The disappearance of forest resources is usually so overwhelming in its local aspects as to involve a change in major type from use to non-use, as indicated in the notable work of Sparhawk and others. On the national level, a little has been done on the general implications of resource exploitation.[39]

6. *Land Economics*

We have reviewed in a brief way the kind of problems towards which land economics has bent its inquiries. These inquiries have been directed at important social problems that may at first appear to involve diffferent issues at different times and places. Yet over a period of at least forty years there has been a persistent direction of attention and a community of interest among an expanding group of men towards these problems.

Upon analysis, we find that these problems have an underlying continuity. The problems are those in which doubt and confusion with respect to social activity are strategically affected by the division of the earth's surface into segments which men hold as units or upon which they organize functioning whole cells or units of activity. These may be called whole surface units. They are placed in human control through the holding of rights in them, which is landed property. And the underlying characteristics of these units are their extent and location and the physical resources within them. An abbreviated statement would be that land economics is a social science that deals with those problems in which social conduct is strategically affected by the physical, locational or property attributes of whole surface units.

7. *Remarks on Content*

Our analysis has dealt with the content of the field and not with its materials. Large as the former question is, the latter is obviously one for a set of volumes. Further, an attempt has been made to put

[38] N. Johnson, Analysis of the present program of research in the economics of soil conservation and suggestions for its improvement. U.S.D.A., March, 1940.

[39] Sparhawk and Brush, U.S.D.A. Tech. Bul. 92, 1929. Nationally the work of John Ise on forests and oil; and on resources in general, that of Erich Zimmerman, and of R. T. Ely, Hess, Leith and Carver in The foundations of national prosperity, N. Y., 1917.

the analysis into dynamic terms, because social problems are inherently dynamic.

The analysis has been tilted towards the experienced problems that comprise the raison d'etre of land economics. It would be a misinterpretation to conclude that it infers an inferior or insignificant status to the preparation of indirect empirical materials or the improvement of analytical concepts (this paper is itself of course a conceptual analysis) for these also offer significant problems to the land economist. They are integral problems but of a different order; and in the final analysis, the test for the solution of a conceptual problem is its usefulness in inquiry into direct problems.

If we state the content of our field in terms of experienced problems, do we thus preclude the organization of a generalizing science of land economics? If so, it would reflect a sad outlook for social science; for it would imply that concepts and bodies of theory were not expected to render service in the resolution of experienced conflicting issues in human activity, but were to be tested only against some methodological concept of ancient science. Further, it would be incorrect to assume that land economics theory can deal only with questions of rents and values, and that all other factors are only "modifying" or "institutional" factors of merely "practical" consideration and outside the content of theory. Topics of the first sort, although more readily, are no more inherently subject to theoretical treatment than are those commonly referred to as "institutional."[40]

II. *Research Method in Land Economics*

As land economists we might all be taking part in a continuing over-all research project, the objective of which would be to determine why some research gives insight into our land economy and some does not. The views submitted here are offered in the hope that they may stimulate and contribute to such an inquiry.

Within the past few years there has been a growing number of valuable contributions to progress in the theory of social research, which indicate that many are working on these same questions. John Dewey's "Logic" represents the direction of thinking in this line in a fairly comprehensive way. It would be clearly unfair to use recent advances in research theory to reprove prior research work.

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[40] JOUR. FARM ECON., February, 1940, p. 49.

If, therefore, past work is reflected against concepts only since available, it must not be to deprecate such work but only to illustrate the constructive utility of the recent contributions.

The 1928 report of the Social Science Research Council recognized eight "research methods": case, analogy, informal statistical, statistical, experimental, geographical, non-geographic cross-sectional, and historical.[41] Most research in agricultural economics reflects the predominance of the accounting (non-geographic cross-sectional) and the statistical, and land economics today shows the influence of these two plus the geographical method.

The accounting procedure of cross-classification and comparison of averages was introduced early in the century by those who formed the field of farm management; and it prospered because it fitted into the widespread policy of helping backward farmers do what the good ones did.

The statistical procedure of correlating numerical attributes of mass phenomena became popular in the twenties. Its popularity was coincidental with the post-war accent on prices and marketing and with rapid strides in the improvement of statistical techniques; and it fitted into the outlook policy to aid farmers by forecasting.

The geographical procedure of superimposing areally distributed data received emphasis late in the twenties to channelize the forecast data by areas, and even greater impetus in 1934 when the need arose to segregate lands for consideration for removal from agriculture.

The statistical, accounting, and geographic procedures had a number of advantages, but the greatest was that they exemplified the prevailing concept of scientific method, that of Karl Pearson as expressed in his "Grammar of Science."[42] This concept stressed the view that scientific method consisted of three steps: the classification of a wide variety and a great number of facts, use of disciplined imagination to discover generalizations, and self-criticism.

The basic question about this outline of scientific method regards the first step: do we first and foremost classify data? There is no

[41] Research method and procedure in agricultural economics, Social Science Research Council, August, 1928.

[42] In the Method and Procedure report, Pearson is quoted 13 times in the first few pages. Many other evidences of Pearson's influence appear in social science research discussions, as e.g.: Lundberg, Social research, 1929; Spahre and Swenson, Methods and status of scientific research with particular application to the social sciences, 1930; O. C. Stine, Agricultural economics—a social science, U.S.D.A., May, 1940.

doubt but that Pearson's emphasis is on the affirmative side.[43] The Social Science Research Council's 1928 report on Methods and Procedures is deeply rooted in Pearson, yet it introduces a new first step of "1. Careful logical analysis . . . in some cases, the formulation of an hypothesis."[44] Clearly this is a minimum essential addition to the Pearsonian statement; for if nothing preceded the classification of facts, how would one know what or how to classify?[45]

The point may seem to be obvious yet we must have often missed it. How often have we compiled stacks of tables, graphs and maps only to ponder over them unfruitfully trying to see some semblance of order in the data before us? Why do we so often say that our publications consist only of tables and graphs and their verbal description, or that having made all kinds of maps of an area we feel at a loss to write an analysis of it? The answer is based in part on the functional importance of hypotheses in inquiry.[46]

1. *Hypotheses*

As Dewey has pointed out, hypotheses are a necessary condition to the sorting of facts as facts-of-the-case or relevant evidence. Social difficulties present to us a troublesome situation for resolution. Our first action as scientists must be to organize it as a problem and then to formulate a possible method of resolution as a beginning hypothesis.[47] In terms of day-to-day practice, our slighting

[43] Karl Pearson, Grammar of Science, Every man's ed., London. Pp. 11, 17, 21–22, 32–34, 37. (First edition, 1892.)

[44] Op. cit., p. 10.

[45] In a footnote on p. 34, Pearson "admits" that "classification of facts is often largely guided by the imagination as well as reason." Again in a footnote, he states on p. 69 that classification is not the same as collection, for it denotes only the collection "not of all, but of relevant and crucial facts." Clearly, the setting of some basis for judgment as to the relevancy of facts is a necessary prerequisite to Pearson's first step of classification. It is not surprising that Pearson, a physical scientist, failed to construct a concept of scientific method that encompassed this point, for, as Dewey has shown, the physical sciences have so far progressed that each inquiry sets up problems and suggests hypotheses for ensuing investigations. The social sciences, however, are not in this advanced position and for them the omission is an extremely dangerous one, although Pearson stresses the usefulness of his formulation for social science in Chapter I.

[46] Dewey, Logic, p. 498 and Chap. XXI.

[47] It should not be assumed that there is no use of facts in these preliminary steps. The common fallacy that these preparatory steps are purely "deductive" or "arm-chair" needs to be corrected. It is this error that explains most of the confused and often circular discussions of deductive vs. inductive research. (See Logic, Chap. XXI.) It may be justifiably argued that many of our studies are preliminary examinations of problematic situations. This is often true, but if so it is important to point out: (1) the desirability of stating the conclusion in terms of the status of the formulation of the problem in order to expedite further research; and (2) the danger of directly accepting the results of such studies for social action.

of these steps is one of our most disastrous shortcomings, for we often move into advanced research operations with no more formulation of the problem than to study, for instance, land utilization in such and such a county. From there on, our activities are largely routine. If we work on a problem stated in such inadequate terms, our procedures will be those of blind-flying.

Administrative requirements often allow only inadequate attention to problem formulation. We cannot remain aloof unless we are given all the time we want before moving in on a troublesome situation. But an intensive effort to formulate issues wherever possible will prepare us to develop better research projects out of immediate tasks to which we are called. And this will mean a gain, not a loss, in the realism of our approach and the direct usefulness of the results.

The lack of directing concepts is perhaps a main reason why many data in our research reports appear almost superfluous, and why some studies appear to be analyses of a series of tables rather than of a series of revealing questions.

Greater attention to the statement of problems and hypotheses would result in a gain in the total efficiency of our work. A common lament, for example, is that land utilization work has no "carry-over value." Having "analyzed" one county, there is nothing to do but to "analyze" the county next to it. Recognition of the functional role of problem formulation and hypotheses would make it easier to see similarities in situations arising in areas outside of those intensively investigated. Also, the results of our direct investigations would be in better form for incorporation into the conceptual materials of the science.

It is in this question of better problem formulation that the treatment of the content of land economics becomes critical. If we continually improve the statement of the problems of our field, we will give a better basis for organizing our studies, and for using the results of them in the development of the total equipment of the field.

2. *Revision of Concepts*

If a first prerequisite of research is the formulation of the problem and possible modes of solution, the second is that these be continually modified as the facts of the case are uncovered. Dewey points to the danger that "Directing conceptions tend to be taken for granted after they have once come into general currency. In consequence, they either remain implicit or unstated, or else are

propositionally formulated in a way which is static instead of functional." This tendency "even in the seemingly most innocent factual inquiries is the greatest single defect that can be found in any field of inquiry." It is "closer to a death warrant of a science than any other one thing."[48]

The importance of continually improving our hypotheses is readily illustrated in much of our land economics work of the last decade. We have tended (1) to hold constant our concepts of what the problems were, (2) to standardize our concepts of the techniques needed in inquiry, and (3) to freeze our concepts of solutions.

For example, in a number of studies, a basic assumption has been that local people should be "related" to local resources. In a number of cases this has been shown to be a fair assumption and a potential guide for action. However, in other cases, if this assumption had been regarded as a tentative hypothesis, it might have turned out to be an untenable one and a misleading basis for policy.

Another assumption has been that all people on poor land are trying to eke out a living by farming. This assumption may often be a reasonable starting point, but it has sometimes been held constant almost to the point of absurdity. From this oversight, we have been led to some very erroneous results, the presentation of which spins the spiral of action work but perhaps in the wrong direction.

Another example is the rigid application of techniques of land classification without regard to the necessity of readjusting them to the conditions to which they were applied or to the relevant problems of the area. In doing this, we have as scientists been guilty of dragging corn-binders into wheat fields.

In 1933, Professor Wehrwein doubted whether we understood tenancy as well as it had been comprehended in 1920.[49] Most tenancy research since has still retained the same types of hypotheses, techniques and recommendations as prevailed 25 years ago.

3. *Evidence*

We are led to the question of the character of our evidence in land economics research; for it is more reasonable to expect that it is our

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[48] Dewey, Logic, pp. 508–509. This danger is increased almost to the point of certainty if a dichotomy is established between conceptual and existential problems. See supra., Remarks on content.

[49] J. D. Black, ed., Research in agricultural land tenure, Social Science Research Council, 1933, p. 9.

methods of procedure rather than our attitude that has turned us from the need for continual revision of hypotheses.

There appears to be a growing awareness that a very important thing about social facts is that they can be carefully organized without being understood. There is no doubt that our best statisticians have laid continual emphasis on the need for very careful interpretation of the significance of statistical results. And this danger of misinterpreting the correlation of attributes is much greater when the correlation is a cross-tabulation of averages or the overlaying of geographically distributed data. For social data, all three of these procedures have the same source of difficulty. They fail to show the sequential order of the phenomenon under study, or to retain the pattern of attributes within the units of observation.

"Every social phenomenon . . . is itself a sequential course of changes, and hence a fact isolated from the history of which it is a moving constituent loses the qualities that make it distinctly social."[50] Lynd, to bring out the allied point, quotes Kohler, the psychologist, as saying "while it is useful to study one hundred hearts together, a single heart has from a functional point of view more in common with a pair of lungs than it has with other hearts,"[51] and Lynd later remarks that after all, "It is *people* who do things."

These quotations illustrate two necessary conditions for the understanding of social facts: the data must have a sequential perspective and they must be set in terms of what people do. The statistical, geographic, or cross-sectional procedures will help us, without a doubt, to come to this understanding but they cannot alone produce it. And if we rely on them alone, we run the danger of burying some important relationships. Quantitative or geographic cross-sectional analyses may sometimes be vivisectional as well.[52] Especially is this important to us in land economics where the nature of our strategic factors encourages concentration on the area which is our laboratory rather than on the human relations which are our subject and the development of those relations which is our problem.

That the prevailing "methods" of research have some such inherent deficiency has been many times recognized. What has been sug-

[50] Dewey, Logic, p. 501.

[51] R. S. Lynd, Knowledge for what? Princeton, 1940, p. 12. The reference is to Kohler, Gestalt psychology, N. Y., 1929, p. 351.

[52] E.g., Salter and Diehl, op. cit., p. 592.

gested to meet it? An illustration is the Methods and Procedures report, which is unquestionably weighted on the side of the statistical method.[53] Near the end of the report, Dr. Nourse writes a very revealing section in which he points out the task "of ascertaining just what is happening and how the several actors or mechanisms are severally performing in the producing of this total situation," and that "Such a formulation of the problem may prompt a further inquiry as to the evolutionary process by which this situation came about and this may be indispensable to any thorough understanding and wise action with reference to it."[54]

Following this section, the report reads: "Dr. Nourse's discussion makes it clear that the handbook nowhere, not even in this section, is as specific as should be as to just how qualitative description is performed. There has been talk enough of the need for qualitative analysis, but little said as to how it is done. . . . No doubt some discussion of the testing of the authenticity of various forms of evidence would be pertinent here. No doubt the principles and procedure of logic are closely involved."[55]

When it is recognized that the usual "methods" are not self-sufficient, the following are commonly offered to make up the difference: (1) that "logic" must be used, as though logic did not have to encompass the quantitative or geographic methods themselves; (2) that more attention be given to preliminary "deductive" analysis, but without showing the functional correspondence of conceptual and evidential materials, or (3) that some sort of "qualitative" research be added, but without specific attention to what this would mean. In practice it sometimes happens that a scientist acquires valuable insight just by his participation in data collection and tabulation. Then we say, "The report has a revealing introduction and a fine concluding section, but what has the material as presented got to do with it?"

4. *Methods vs. Types of Evidence*

The basis of this very real confusion and of our failure to resolve

[53] Eighty-five per cent of the space given to eight methods is devoted to statistical procedure. The informal statistical method is treated as a method of poor statistics. As to the historical method, if good statistics were available "it would surely employ formal statistical method," but "lacking such data it resorts to informal statistical method; lacking this, to case or monographic studies and even analogies" (p. 341). The experimental method "for the most part, . . . must be looked upon as supplementary to the statistical method." (p. 322).

[54] Methods and Procedures, pp. 326–327.

[55] Ibid., p. 328.

it may be rooted in the prevailing belief that there are various alternative "research methods," that these stand in some hierarchy of acceptability, evaluated in advance and "in vacuo," and that the scientist merely makes up his mind as to what "method" he will pursue.[56]

Perhaps we should regard these not as scientific *methods* but as available procedures for handling different types of evidence. If we see scientific inquiry as a process of sorting facts as evidence and conjointly revising hypotheses as conceptions to direct the ordering of evidence, we may also see the more frequent necessity of combining a number of these, not methods of research, but procedures for arranging different types of evidence.

If procedures for geographical or mass quantitative evidence have the advantages of offering a wide base of observation, precision and formality, perhaps case, analogical, and historical evidence has the advantage of revealing the sequential nature of social data and the living heart of the activities of human beings. What we might do is to use such evidence as the evolving analysis requires, and to use the proper procedures for handling each type of evidence, rather than to adhere to some "ritual of scientific practice at the expense of its substance."[57]

But an important point needs to be inserted here. In the first part of this paper the content of the field was given as a set of related experienced problems. Here we also are dealing with research on direct problems, but not to infer an insignificant status to integrally related inquiry dealing with the improvement of conceptual materials. It is in this latter order of inquiry that specialized use of some one of the commonly recognized "research methods" will be needed, for it is work aimed at preparing a certain kind of evidence.

Briefly turning to the other procedures which have been generally neglected, the Methods and Procedure report says of the historical method, which is outlined by Dr. Gray, that it "represents a contribution to methodology that has gone further than anything presented elsewhere in this handbook."[58] If historical research is regarded as dealing with events of a completed past period, it is on the order of preparing materials to be used in research on problems of the present. It can also mean a phase of a current inquiry in

[56] Supra., 53. Cf. Lynd, Chap. II.
[57] Dewey, Logic, p. 205.
[58] Pp. 341–342. Cf. supra., 53.

which the social process is brought up from the past to become the moving present. In this view, historical evidence takes on much greater significance than we have attributed to it.

In reference to the use of the case study, time and again the famous phrase of Marshall is repeated, that the case study "at its best is the best of all,"[59] but that because it cannot be trusted in "ordinary hands" the mass statistical method is to be preferred. That we have been so ready and willing to classify ourselves as "ordinary hands" is interesting; that we have accepted these as alternatives is more important; that we have failed to see the *functional* difference of these two procedures for handling different types of evidence has been nearly fatal.[60]

I would like to emphasize two other procedures for ordering evidence that are intermediate between the case and mass-attribute types. They may be called vertical or functional classification and case-grouping. The first requires the classification of data in terms of the internal pattern of the significant attributes of the functional units under study. It is illustrated by the logical advantage that Professor Davis' type of farming system had over the more prevalent wholesale-dot-map systems and by the F-H-T-O system of the agricultural ladder studies. The procedure is allied to the representative firm or ideal type concepts, but it is not identical with them.

The case-grouping procedure is rather similar to vertical classification but on a different scale of intensity. Inwardly, it involves greater detail in analyzing the pattern of attributes of the functional units, and externally it involves the handling of fewer units.

If there is any point in the preceding remarks, it would be lost if interpreted as an argument for or against any one of the so-called research "methods."

5. *Some Past Examples*

As has been indicated, a number of writers have been contributing concepts that are closely related to or a part of the analysis

[59] Principles of Economics, London, 8th ed., p. 116.

[60] Analogy is usually even more quickly dismissed than the case method, as in the Method and Procedures report, p. 298, Spahre and Swenson, op. cit., and others. In marked contrast are phrases characterizing the scientific attitude: "a mind at once discursive enough to seize resemblances" (Bacon) and "a keen eye for relevant analogies" (Dewey). For unusual attention to the functional utility of analogy in social research (and for the whole matter of types of research) see P. A. Sorokin, Forms and problems of culture, Rural Sociology, September, 1936.

here presented,[61] and Dewey, after long work on the fundamental problem of the relation of knowledge and action, has prepared a formal, modern statement of the theory of inquiry.

In spite of the recency of these contributions, however, we are not without some empirical evidence of their utility. A careful review of published land economics studies will reveal that some can be characterized as aiming to lay open a problem, to expose the strategic factors in it, and to trace its consequences. Space does not allow a detailed examination, but it would be a great omission if attention were not called to some of them. Remembering the usual practical limitations placed upon our productions, and the state of knowledge and the conditions under which researchers labored at the time, and without trying to be complete, we can well afford to take another look at the land settlement work of J. D. Black and L. C. Gray, the Vermont study of C. F. Clayton and L. G. Peet, the N. J. Pine Area study of A. T. M. Lee, the land value work of L. C. Gray and O. G. Lloyd, the arid land studies of E. O. Wooten and R. P. Teele, and the Texas tenancy work of C. B. Austin and G. S. Wehrwein.[62]

Taking these studies as a whole, one need not read very far before it is clear that the writers had formulated problems to probe. Further reading will indicate that the authors proceeded into the problem posed, tracing its origins and consequences, turning down untenable hypotheses, giving emphasis to the revelation of strategic factors, pointing out unresolved doubts, structuring significant generalizations, and suggesting means of reordering the outcome of the social process. In general these studies, and the few others like them, not only try to show where and how much; they

[61] A wide variety of terms has been used to designate the concepts: cultural approach, by Lynd and others; logico-meaningful, by Sorokin; social process, by Landis and others; scientific humanism, by M. L. Wilson and others; and the evolutionary, behavior, qualitative, institutional, or functional by yet others. In agricultural economics literature many writers have emphasized the general weakness of prevailing research in such terms as to reflect the need for a more fruitful concept of inquiry, e.g.: E. G. Nourse, supra., 54; H. C. Taylor, Research in agricultural economics, JOUR. FARM ECON., January, 1928; L. C. Gray, op. cit. in JOUR. FARM ECON., April, 1928; S. von Frauendorfer, Development, methods and results of agricultural economics research in the U. S., ibid., July, 1928. Also see: M. M. Kelso, Critique of land tenure research, Jour. of Land and Pub. Utility Econ., November, 1934. The same type of implication that the above works evidence is also to be found in many other papers on specific types of land or agricultural economics research.

[62] Supra., 7, 12, 26, 28 and N. J. Ag. Exp. Sta. Bul. 665 (1939). A more complete review would also include certain briefer research reports in journal literature.

also try to tell what is going on and why it is so. If the word insight can be applied to modest investigations, the reader of such bulletins as these will admit that their authors achieved it, and he will see how they got it.

Most of these reports are contributions to a literature in land economics, and if some of their analyses now seem elementary it more than likely indicates that the insights revealed find an important place in the conceptual materials of land economics long since the reports were filed away.

In regard to research techniques in these studies, in general they have some common characteristics. They defy classification as to "the" research method used, except that of selective ordering of relevant evidence. Note in these reports the multiple use of case, analogy, accounting, historical, geographical and statistical evidence. Vertical classifications and case-groupings are used; historical data are brought up into the moving present of the problem under scrutiny; and the "physical background" data comprise, not an atlas, but a statement of the direct relationship of strategic physical facts to the problem. And finally, the use of a wide range of sources and kinds of data and the relating of these data to conceptual materials is general.

Apparently, these men did whatever they had to do within practical limits to check, test, and revise their hypotheses as to the causes and consequences of an existing problem. Since there was no formal theoretical framework to bolster these procedures, they fell into obscurity under a passing emphasis on what now may be regarded as a less sufficient research concept.

Were time available to round out this analysis more completely, we would indicate that in parts of a number of other studies, as the researchers free themselves to exercise the approach we speak of, they begin to reveal insights into the problems at hand. And finally, if we were to turn our attention to analyses on the order of conceptual material analysis, we would find certain studies, like Chambers' on the Relation of Land Income to Land Value, Hibbard's History of Public Land Policies, and Taylor's Decline of Land Owning Farmers in England, are directly oriented to serve in the analysis of immediate problems.[63]

6. *Concluding Remarks*

The whole history of land economics may be seen as a case study

[63] Supra., 28, 24, Hibbard, N. Y., 1924.

of an evolving relationship between knowledge and action; one in which the ancient barriers between knowing and doing, between theory and practice, have been turned into a connecting tie. Within the past decade the balance wheel may have been out of adjustment —on the one side towards a less realistic concept of science and on the other towards pressed attention to common sense judgments. Perhaps if we try to develop a more revealing type of research and better assimilation of the rich materials that recent experiences have given, our work may simultaneously contribute more directly to social planning and improve the organization of our materials for future progress. For the great modern task of keeping knowledge ahead of social action, the field of land economics has an advantageous heritage.

DISCUSSION BY CONRAD H. HAMMAR

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The analysis of Salter appears fairly complete even if a bit prosaic. I am disappointed at the small attention given to land classification but that appears to fit in with the major drift of the paper which emphasizes content and techniques rather than tools and materials.

Land classification, it has always appeared to me, represents a major routine duty of the land economist. It affords him the needed intimate knowledge of the phenomenon with which he works. Such knowledge is as necessary for the land economist as an acquaintance with farm practices is to the farm management specialist and price data to the price analyst. If the central viewpoint of land economics is to promote a finer allocation of land to various uses that society determines to be desirable, the land economist must know the attributes of land intimately if he is to be of greatest help.

The second major characteristic of Salter's paper is his emphasis upon content rather than organon. We do not have available in land economics a strikingly good set of tools and no one has made a major effort to provide them. For a competent analysis of rent one looks more to Robinson's economics of imperfect competition than to things the land economists have written. Land economists have not been notably successful in supplying a competent theory of conservation and they are even now lagging badly in their contributions to the dynamics of land use. Almost certainly there is a tendency to overwork the few tools we have. The constant reference to methods of land value analysis that Chambers worked out two decades ago is one instance of the dependence on worn tools, and the intense preoccupation with rural zoning recently is another. One reason for the lack of carryover power of land economic studies to which Salter refers is our paucity of tools.

A further characteristic of Salter's paper is the fact that he looks in only one direction in his analysis of the content of the field of land economics. He looks only backward when, in actual fact and particularly in an age

just beginning to plan in a national sense, the forward look is much the most important. The contributions of the land economists of the past were made in an era of the dominance of laissez-faire. There was a certain element of the "natural order" presumption in much of their work and particularly in the work of Ely who lauds the profit motive and sought earnestly to make a competitive system work. Tenancy to Ely was benevolent and conservation pretty much a matter of failure to preserve properly. A number of the ideals of the Nation were not threatened as they are at present.

Now, land economics tracing from such origins does work upon problems (past problems, or experienced problems, as Salter designates them); and these problems are those that a laissez-faire viewpoint casts up. Without viewpoints and without ideals and ends there can be no problems. To be sure the earlier land economists had moral scruples and these sometimes are aired but they did not on the whole give broad recognition to the fact that society determines its ends as a dynamic process. Ends and ideals were to them in general to make a laissez-faire system work better. A review of their work, therefore, may have no great relevance to the present and particularly to the future if the dominance of laissez-faire is as lame a duck as I believe it now to be. I should say, therefore, that Salter's dictum that "scientific inquiry must ultimately be related to the solution of experienced problems" very widely misses the most important fact facing land economists today. It implies that our science is still to be driven chiefly by the hands of a dead past. I should say that we should reject any such dicta as we would drop a red hot poker. We need to know the problems of the past but the service of the science should be dedicated to the attainment of the ends and ideals of a living society and these ends and ideals have gone through a significant metamorphosis in the last decade or two.

Now, I have not referred in the above to a merely superficial aspect of Salter's paper. Rather, reference is to a central concept though he has included the usual number of escape clauses. He reveals the set of his thinking most clearly in the section on research methods when he calls for a flexibility in the formulation of hypothesis leaning chiefly for authority on John Dewey. To me this reliance on Dewey when there are available the works of Keynes, Hicks, Hansen, Robinson and others, is further evidence that Salter has tied himself too much to the past. Why refer to a philosopher in a warning that hypothesis must not be kept too rigid when a brilliant group of economists has already burst old rigidities of mind with breath-taking pronouncements containing dozens of new hypotheses all available for use?

My own feeling is that the field of land economics will and should go through a reshaping to take advantage of the recent contributions of the economists I have mentioned above and the great new body of literature patterned after their contributions that is now available. In fact such reshaping is already going on in the Bureau of Agricultural Economics if the July number of the *Land Policy Review* is to be taken as at all significant. I have a suspicion that the land economists now in the field will either acquaint themselves with these new organon or they will find themselves at a definite disadvantage in comparison to younger men entering the field

with a greater command over this type of knowledge. I should like to suggest as an introduction to this new economics a book that a number must already have used, viz., Alvin Harvey Hansen's *Fiscal Policy and Business Cycles*."

The contents of this book, and indeed the *Land Policy Review* for July, indicate the nature of the leaven that is already at work in reshaping the future efforts of the land economist. Many new and interesting questions are proposed for us. What will be the effect on land utilization in the country if the Nation adopts as an ideal the raising of the nutritional plane of all its citizens to a health sustaining level? Are land economists looking forward to the demands that will be made upon their information if the Nation embarks upon a comprehensive program of forest restoration? Are land economists prepared to provide pertinent information if the government and the states find it advisable to inaugurate a huge conservation investment program after the war? Hansen projects a National income of from $250 to $300 billion in fifty years. Are the land economists preparing a blue print for land use and occupancy at a time when the average family income is about three times its present level?

To me it is quite axiomatic that the content of land economics will be geared to and determined by the efforts of the Nation to attain objectives of this kind. These are indeed ends that society sets for itself and in an age that is preparing to make great use of planning it is somewhat of a shock to find a competent land economist still willing to emphasize a mere "experienced-problems" approach as the central core of effort for our science.

For my part, therefore, the definition offered by Salter " . . . that land economics is a social science that deals with those problems in which social conduct is strategically affected by the physical, locational, or property attributes of whole surface units . . ." misses the great point of orienting the science for the attainment of ends that society formulates. As an alternative definition, therefore, I should like to offer one of my own. Land economics is a social science the purpose of which is to formulate a systematic body of (economic) knowledge, with respect to the attributes and uses of land, that society may employ as an aid in determining what allocations and uses of land will best serve to effectuate established or emerging ends and policies.

DISCUSSION BY R. R. RENNE

Montana State College

Mr. Salter contends that land economics problems are "those in which doubt and confusion with respect to social activity are strategically affected by the division of the earth's surface into segments which men hold as units or upon which they organize functioning whole cells or units of activity. These may be called whole surface units." He also refers to "whole surface units" in his abbreviated statement defining the field. Frankly, I feel the inclusion of the phrase "whole surface units" weakens the definition, particularly in view of the intensive use of subsurface areas in many instances, and of supersurface areas in others. It is true that location and physical resources are basic characteristics of land influencing the problems asso-

ciated with its use, but these are not limited to surface units. It seems to me that too much emphasis on surface units has been an important factor contributing to current confusion between farm management and land economics.

Is not land economics a study of economic situations and problems—those dealing with cost, price, value, income, and use control aspects—in which land (or the institutional arrangements concerning its use) is the strategic, limiting, or decisive factor? In farm management, the strategic or limiting factor is *management*, while in land economics it is *land*, either because of its natural qualities of location and resources (fertility) or because of institutional arrangements or patterns established to govern its use. Some have tried to distinguish between the two on the grounds that the focal point in farm management is the individual farm operating unit, while in land economics it is usually a much larger area or perhaps a broad functional problem such as effects of the land-tax system on land use and tenure in a given region. This is not the basic distinction, however, although areal distinction is in some respects valid, in the sense that it indicates the problem is not one of management (a personalized or individual factor) when, like tax delinquency, foreclosure, tenancy, or erosion, it covers whole areas or a very heavy proportion of farms.

Obviously, the solutions for land economic problems will be quite different in nature and procedures utilized from those for farm management problems. Let us consider for a moment the methods applicable to solution of tax delinquency problems in a given farm area, for example. The individual operator's managerial ability is indeed a very minor, insignificant factor in achieving a satisfactory solution. Group action to bring about institutional rearrangements in land classification, assessment, and tax collection will usually be necessary. What a contrast to the individual rearrangement of enterprise relationships on a given farm to solve a perplexing farm management problem. This example will tend to explain why land economics will likely have a public or social point of view or emphasis rather than entrepreneurial success. Management is not the limiting factor, but rather public or collective action is required. It is not difficult to see the importance of land economics as a fertile field of study in view of the serious land tenure, tax, credit, conservation and use control problems which confront us.

Mr. Salter's analysis of land utilization and landed property problems is helpful. Strictly speaking I agree with Salter that land taxation and land credit problems are land tenure problems arising from aspects of human behavior in which property rights in land are the dominant directing factor, just as are tenancy problems. However, land taxation and credit problems are so large and significant, and courses of study, research and administration have already been established in these fields that it is not wise from a practical point of view to include these fields within the general subfield of land tenure. Land utilization, which as Mr. Salter points out is the largest subfield of land economics, has tended to emphasize type of major use to the exclusion of the type of economic or social problem involved in land utilization. Salter indicates that land utilization problems include those situations in which "a process of shifting 'major land uses' is strategic to

the achievement of social well-being." That is, the problems arise out of the shifting from one pattern of major land uses to another. However, emphasis should not be on the major use, but on the resulting problem. Textbooks in land economics should be organized around land economics problems, with chapters or parts devoted to each major problem like tenancy, credit and valuation, taxation, and conservation, rather than devoted to a rather descriptive analysis for each major land use. Too much emphasis in the past has been put upon descriptive land utilization surveys explaining the utilization pattern. More emphasis needs to be put upon land utilization problems.

As indicated earlier, I have little fault to find with Mr. Salter's treatment of the content of land economics, aside from the minor criticisms noted. However, concerning his second part, namely "Research Method in Land Economics," it is a satisfactory general appraisal of research methods for social science investigations, but I fail to find any adequate appraisal of such methods as applied to specific types of land economics research. Only a small part of this section really comes to grips with the subject matter indicated in the title of the paper, namely *Research Methods Adapted to the Needs of Land Economics*, and the major portion although well written and interesting, does not. Solutions of land economic problems are generally quite different in nature and procedures utilized from those for many other types of agricultural economic problems. But the paper fails to give us very much specific enlightenment on the research methods adapted to the analysis and solution of land economic problems. Perhaps the title should really have been treated in two topics, (1) Definition of field or content, and (2) Research methods adapted to land economics. Obviously land economics being a social science is subject to limitations of methods applicable to all social science techniques. However, the title implied an adequate analysis would be made of specially adapted research methods for analysis of land economic problems.

DISCUSSION BY HARRY C. WOODWORTH

University of New Hampshire

Mr. Salter discusses the content of land economics in the first section of his stimulating paper. He states near the beginning that "the content of a field of science consists of the problems to which the science turns its attention." He then lists and discusses land utilization, landed property, location, and resources. This is a logical and effective way of delineating a complicated field. The subfields and the categories may overlap and not fit neatly together, but this is not important. The difficulties encountered in grouping all the categories systematically under land economics is indicated by four short quotations from his paper. (1) "The largest category of land economics is land utilization research." (2) "Land utilization is the broadest subfield under land economics." (3) "A careful review of the work (research in land utilization) reveals that they are all situations in which a process of shifting 'major land uses' is strategic to the achievement of social well-being." (4) "In a sense the categories of land economics other than land utilization may be regarded as specialties; for while they are aimed at

problems in which changes in major uses are not the immediate source of confusion, they deal with phases that always will form some part of a land utilization inquiry."

Does this mean one subfield and several specialties or does the emphasis on "shifting" and "changes" in the sentences quoted above imply a second subfield? That is, in addition to land utilization which relates to shifting major land uses, is there an implied field which is related to stable major land uses?

It seems to me that Mr. Salter has narrowed the scope of land utilization research more or less to an area analysis type of research and that the specialties mentioned represent more largely a topic or functional approach. The point is that a slight broadening of his land utilization concept to include stable as well as changing major land uses would make land utilization just about synonymous with land economics.

In New England, the term "land economics" is not in common use. A committee of the New England Research Council reporting on land utilization research interpreted it as a broad field consisting of many complex problems. It considered that many of these problems involved directly at least three disciplines: sociology, economics, and government. Thus we in New England tucked land utilization as a group of special problems under the several social sciences.

Now, the New England committee felt that the problems and situations involved in land were very complex and that these did not fit simply and definitely under even a broad definition of any one of the social sciences. Moreover, the committee soon found that the subfields overlapped, were not on the same level, and did not necessarily constitute logical subgroups. In the words of the report: "They do form a basis for discussion of the land utilization problems involved in New England."

If I interpret Mr. Salter's paper correctly, land economics is used by him as a general term. He does not have in mind a narrow compartment type of economics applied to land problems. Nor does he have in mind new economic principles or tools. He has in mind, I think, a field of social research that cuts across the several social sciences in the application of not one but all the social sciences to the solution of land problems.

If this interpretation is correct, is Mr. Salter's land economist a generalist in the sense that he has acquired some of the tools and skills of the several social disciplines, and is he a specialist in the sense that he limits his activity to land problems? Is he a generalist in social science, but a social science land specialist?

It seems to me that a highly specialized economist who has not acquired some of the other essential disciplines is likely to have some blind spots in important phases of land utilization. Association with certain other special skills should at least reduce the blind area.

For instance, it seems to me that certain land utilization studies have failed to consider the whole economy of the rural area. The economist has analyzed the situation in terms of efficient operators on economic units of land. In the program set up the land which does not fit into this concept is to revert to forest or no use, and the people who do not measure up to the standard of efficiency are to disappear to the village. The concept of

economic units of land under the direction of able men represents a logical objective, but the picture is not complete until the whole economy is studied. What becomes of the inefficient and the underprivileged who are driven off the land is important. They do not disappear automatically, and their piling up in the slum section of the villages is not so good. Can the economist safely conclude that the inefficient driven off the farms will be absorbed by industry? I believe that a thoughtful revaluation of certain studies by giving more emphasis to public finance, government, and social welfare problems of the whole community would be profitable.

What are the possibilities that these families can find a place in the industrial centers? Are there opportunities or can opportunities be created for productive employment in the villages? Can the village be replanned or decentralized to afford a better opportunity for the people driven off the land to keep a cow, a few hens, and carry on limited production for their own use?

As I interpret Mr. Salter's paper, he would start with the problem and train personnel in economics and as much of the other social disciplines as would be necessary to fit this personnel to handle these difficult land problems. It seems to me that this is logical.

I believe, however, that under the very complex situations in New England a generalist would not be quite enough. I believe that the problems should be submitted to a clinic.

Now, I realize the difficulty of getting men with different backgrounds and training to apply cooperatively their special training to such problems. They do not use a common language, some of them have difficulty in adjusting their thinking to concrete problems, and time for orientation would be required. On the other hand, I feel that the younger men will have to acquire the ability to work cooperatively in solving definite problems, and that in the future this sort of clinic will be profitable. Moreover, this procedure is an important factor in training the generalist. If it is impossible to get the specialist in sociology, in government, and in economics to face and experience real problems much as a clinic of physicians would, I fear that we shall fail in the best development of research. If we leave the training of the generalist and the organization of the studies in the hands of the economist alone, the potential research resources of the other disciplines will not be developed.

For many studies, especially those involving immediate readjustments of rural people, one additional step should be taken. This would be a sort of second clinic in which the experience of rural leaders and representatives of action agencies is focused on the analysis. The machinery for this is now available in the form of county policy committees. The clinic should result in a briefing of the problems and the spelling out of the recommendations in simple, understandable language.

DISCUSSION BY HARRY A. STEELE

Bureau of Agricultural Economics

Mr. Salter has presented a stimulating outline of the field of land economics and some timely criticism as to research methods. I am in agree-

ment with most of his paper; however, I believe we should make some additions in order to narrow the gap between research and social action.

It is pointed out that land utilization research is concerned with situations in which a process of shifting "major land uses" is strategic to the achievement of social well-being. Major land uses are types of activity that are significantly different in the surface requirements of their operating units. No particular difficulty is experienced in studying shifts in major land uses or in formulating some of the consequences to various individuals, groups or institutions affected. However, the problem that has been presented to land economists most frequently in recent years is—what type of major land use is best? When an attempt is made to project a type of major land use some serious difficulties arise. How do we measure returns from various types of major land use—by returns to individual operating units, by the efficiency of resource use, or by some appraisal of group or social returns? Presumably this question should be answered in terms of social well-being, but it has been pointed out many times that social net returns include many values in addition to monetary values and that they cannot be arrived at by addition of individual returns. The researcher trying to project a type of major land use will find it impossible to measure non-monetary values accurately and thus will be forced to make assumptions on which to proceed. Of course his assumptions will be most valid if based on a study of experience and are constantly revised as new evidence indicates, but in the end a projection of major land uses is based on assumptions which may or may not be acceptable as a basis for social action.

As an illustration of these difficulties, let me cite an example. Many others could be mentioned. One of the major problems in certain areas is the conflict between so-called commercial or large-scale operating units and the smaller family-sustaining units. These two types of operation while they may produce some of the same commodities would seem to fall under the definition of different major uses because of their differences in surface requirements. In fact, it is usually stated that the large operation is absorbing land, thus displacing the family type unit. The land economist can describe and analyze the situation and can clarify the statement of the conflict between the uses, but the fundamental problem of which is the better use cannot be solved by research procedures alone. Is it more desirable to have a larger farm population on family type farms or a smaller farm population on large commercial type farms? Many groups are currently interested in this problem and are actually presenting persuasive arguments on both sides of the question. There are no generally accepted standards by which to measure the various arguments and evidence.

Mr. Salter's paper would seem to imply that the researcher should formulate an hypothesis as to which of these major uses is best and then organize the evidence to test this hypothesis. After study of the evidence and possible revision of the hypothesis, the researcher should then project the most desirable type of major land use.

The single direct answer provided by such a research method must depend on assumptions and we soon find that one or more of the interested groups are not willing to accept our scheme of values. Our one answer is

thus invalidated for that group and our projected type of major land use is not acceptable. The research program does not become the basis of social action.

Dr. Kelso has attempted a solution to this problem by suggesting that land utilization research can point out alternative courses of action, predicting within reasonable limits the consequences of these lines of action, and he goes on to suggest that it is the province of land use planning to select what ought to be or what will be done, and to what extent.[1] To this we might add that many other groups and interests will enter into the decision.

I have stressed these points because it seems that the important problems in the field of land economics arise largely from conflicts in the control and use of land by individuals and groups. Many of these relations are governed by institutional arrangements rather than price or market reactions. Solution to the problems will come largely through group action. Therefore, a good part of our work must be to study ways in which group action can resolve the problems that arise from conflicts in relationships.[2] While we lack accepted standards by which to appraise many of these institutional arrangements, we can point out many of the alternatives, some of the sacrifices and benefits involved, and some of the ways in which groups may function in resolving problems.

Some of these thoughts must have been back of the formation of the land use planning program, of the growth of the idea of enabling legislation such as rural zoning under which local groups can solve their problems, of the idea of local land management districts of various kinds, and in the general idea of agricultural democracy. While the published materials in the field of land economics may be weak in conclusively proving the desirability of some solution to problems or in projecting patterns of land use, there has been great advancement in devising ways by which adjustments can be brought about by group action. Taking into account the slowness of institutional change, a review of the last 10 to 15 years would show surprising results.

At least three implications to land economics research might be enumerated: First, since group action is the instrument through which social ends are achieved, the land economist must study how groups function to resolve the conflicts and settle the differences that make up the problems in the field of land economics. Second, he must present alternatives for consideration in which he traces out the consequences of various lines of action. Third, when a general line of action is agreed on, land economics research can point out means for execution and application.

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[1] Kelso, M. M., Trends in land utilization research in the United States, Proceedings New England Research Council, Boston, Massachusetts, April 23–24, 1941.

[2] Parsons, Kenneth H., Social conflicts and agricultural programs, JOUR. FARM ECON., 23(4), November, 1941.

RECENT REGIONAL CHANGES IN FARMING AND PROBABLE FUTURE TRENDS[1]

R. L. Mighell, C. W. Crickman, H. L. Stewart, and K. L. Bachman[2]
Bureau of Agricultural Economics

THE PURPOSE of this paper is not only to consider current changes, many of which may initiate radical changes in future agriculture, but also to examine some of the past beginnings of future trends, to look especially at those that seem to be continuing through the present, and to try to indicate what probable changes may be expected in the years ahead. Some consideration will also be given to the long-time desirable changes for which planning may be needed.

On so vast a canvas only a few of the more outstanding changes can be sketched in the limited time available. For convenience the discussion has been set off in four regional parts dealing with the Northern Dairy Region, the Corn Belt, the South, and the West.

Certain general benchmarks have been assumed throughout the paper. Discussion of the past touches mainly on the period since 1920. For the duration of the war it is assumed the United States will supply Britain with all the food supplies that are needed to fill out the British war diet. These quantities will probably exceed those contained in the present Lend-Lease program. Russia, China, and, in addition, any nations that break away from Axis domination may also receive substantial quantities of food. Our own military and naval forces will take increasing quantities now that the war has spread to the Pacific.

In the post-war rehabilitation period, even greater food stocks may be needed for a few years.

For the long-run post-war period, we assume a successful conclusion of the war with a better peace and much more international cooperation in the distribution of food and other goods than took place in the interlude between World Wars I and II.

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[1] This paper was read at the 32nd annual meeting of the American Farm Economics Association at New York City, December, 1941. It represents a digest of a longer paper prepared for discussion at the meeting.

[2] Primary responsibility for preparing each of the four regional parts of this paper was assumed as follows: The Northern Dairy Region by R. L. Mighell, the Corn Belt by C. W. Crickman, the West by H. L. Stewart, and the South by K. L. Bachman.

We do not assume the imminence of Utopia but only that some substantial steps may be taken toward a better future.

The Northern Dairy Region

The Northern Dairy Region—including the 3 Lake States (Minnesota, Wisconsin, and Michigan) and the 12 Northeast States—has a varied agriculture. But the most outstanding characteristic of the period since 1920 for the region as a whole is the persistent and continued upward trend in dairy production.

A pronounced upward movement in egg production has also occurred. The expansion in numbers of chickens on farms has not been great but the production of eggs has increased about 30 per cent since 1924 in both the Lake States and the Northeast States.

Other classes of livestock, including horses, have tended downward throughout this period.

The expansion in the production of dairy and poultry products in the Northern Dairy Region has been made possible by increases in feed crop production, by the release of feed incident to the recession in other classes of stock, and by increased rates of feeding purchased concentrates.

In the Lake States where the increase in milk production was nearly 25 per cent from 1924 to 1940, the increases in feed crop production were especially marked. Tame hay acreage, for example, increased about one-fourth; alfalfa expanded manyfold. Although small grain acreage declined somewhat, the acreage of corn harvested has increased substantially in the Lake States in the last two decades. Silage production has increased and hybrid corn has raised corn yields in areas near the Corn Belt.

In the Northeast States the rate of increase in milk production has been only about half as much as in the Lake States since 1924. Here feed production has changed less markedly. Tame hay and corn acreages have actually decreased around 10 per cent. Small grains have also reached a lower acreage level. However, the increased proportion of alfalfa and other legumes in the total hay crop has improved yields and feeding quality. Silage corn production, too, appears to have increased. The very high rate of decline in horses on farms in the Northeast and in cities has been a very important factor in releasing feed for dairy production.

Trends in the Northeast have been toward a higher rate of concentrate feeding, improved hay and pasture practices, and a tend-

ency for production to become more concentrated on better grade lands. Much of the hay land decrease, for example, has occurred in less productive areas that have been going out of farming.

For a number of reasons the fortunes of tobacco, wheat, potatoes, and some fruits and vegetables have been declining in recent years. The tobacco and wheat situations are so well known as to require little comment here.

Potato acreage fell away about 30 per cent in the Lake States and 20 per cent in the Northeast. As in the case of many fruit and vegetable crops, potato production has shown a marked tendency toward concentration in specialized areas. An upward trend in yield, is closely related to this tendency. Potato production, for example, declined only moderately in the Lake States and about held its own in the Northeast in spite of the smaller acreages.

New types of farm machines have had somewhat less influence on crop production in the Northern Dairy Region than in other regions. But technological changes in feed production—alfalfa and other legumes—the use of lime and fertilizers, and improved seeding practices have significantly improved the livestock feed base.

In the Northern Dairy Region and in some dairy areas elsewhere, one of the major effects of World War II will be to erase several years of the time that would normally be required to adjust dairy production to an enlarged roughage feed supply.

In the Northeast States recent changes have affected yields more than acreages. The emphasis on improved practices and increased proportions of legumes in hay tends to improve both yield and quality of the forage. The effects of these improvements do not show up rapidly either in roughage production or in milk production because they come slowly and may be obscured by variations in rates of feeding purchased concentrates. But they are none the less substantial.

For the immediate future, war production goals and the means that may be adopted to reach them will determine how far food production will be pressed in the Northern Dairy Region. The need for tremendous quantities of cheese, evaporated milk, and dried skim milk together with increased domestic demand for other dairy products has set a preliminary national goal for milk production in 1942 that is 7 per cent above 1941. Of the total United States increase needed, the Northern Dairy Region is expected to provide about half. The Lake States are expected to increase about 10 per

cent and the 12 Northeast States, 5 per cent. Many observers believe that special programs will be needed to put feed within the economic reach of dairymen. Surplus wheat *could* be released at a low price for feeding purposes. Freight rates on feed moving into critical dairy areas could be reduced as the Canadians have already done. Direct cash or feed payments might be made to individual dairymen as a special inducement for increased production.

Wartime expansion may approach the desirable long-time level of dairy production in the Lake States and, perhaps, exceed it in the Northeast. Possibly the aggregate volume of milk production in the Northeast will be due for some reduction from war levels over the longer run. During the historical process of building up the present fluid milk sheds and marketing systems in the Northeast, some high-cost production has been maintained which could not have stood on its own feet in the face of open competition. The practice of excluding cream shipments from distant areas by health regulations, for example, cannot be expected to continue indefinitely.

From the point of view of farmers' welfare in the Northeast over the long-term, some moderate post-war contraction in dairying would not necessarily be undesirable. Under our general assumption of a healthier economy in the future post-war world, some farmers on marginal land in the Northeast may do better in other occupations. The great majority of farmers may well enjoy higher incomes than in recent years even though they may be slightly fewer in number.

In the Lake States, too, there are some marginal dairymen who may find more profitable employment in post-war industry. We can doubtless expect in both regions an increasing specialization in dairying and improved farm incomes for those farmers who are able to take advantage of improved technology.

What about other lines of production in the future—poultry and eggs, for example? Here we may, perhaps, expect to see a continuation of the trend of recent years toward specialization. Relatively more of the total production will come from commercial flocks and less from small farm flocks. The relative advantage which the Northeast has enjoyed because of an earlier start in this direction may not be maintained. The Lake States may equal and, perhaps, outdistance the Northeast because low-priced feed supplies are nearby and alternative industrial opportunities are, perhaps, not as close.

As in the case of dairy products, much will depend on the level of national income. The nutrition specialists, however, do not seem to feel that we are so far below par in poultry and egg consumption as in dairy products. Hence, we may not have so much room for upward growth in poultry production.

Potatoes and fruits and vegetables, in general, are not likely to expand in the Northern Dairy Region because of competition from other regions. Developments are likely to take the form of better adjustments to the best soils and sites and increasing efficiency in management.

The Corn Belt

The Corn Belt is a region of surplus production in the sense that it has a much higher potential capacity for production than has been used at any time since the close of World War I. The pressure on farms after World War I for continued or even fuller utilization of the high potential capacity for production generated one of the most serious problems of post-war maladjustment.

During the 1930's following the enactment of the Agricultural Adjustment Act, considerable progress was made toward adjusting crop acreages to decreased export demand and toward a more conserving use of the land. Corn acreage in the 5 principal Corn Belt States in 1940 was 22 per cent below the 1928–32 acreage. Oats and barley were down about the same. Soybeans, however, had expanded to take up about half of this reduction. The other half had been shifted to hay and pasture.

But increased yields of feed crops more than offset the decreases in acreage. Corn yields in the same 5 States (except Missouri) were 20 to 30 per cent above the 1922–31 10-year average. The percentage of legumes in the hay acreage also increased markedly.

Production of all feed crops combined during 1938–40 average 10 per cent above 1928–32. Feed grains production, including soybeans, was 5 per cent larger; hay production 31 per cent; and pasture 14 per cent.

The number of animal units during this period increased but not as much as feed production. Grain-consuming animal units were up 3 per cent and roughage-consuming animal units increased 10 per cent. Hogs increased 6 per cent, milk cows 8 per cent, and other cattle 32 per cent.

In 1940, with the smallest corn acreage in 40 years, one-fourth of

a total annual corn crop was in storage and hog prices were below $6. The most pressing problem appeared to be that of the profitable disposal of the accumulated stocks of corn.

Then almost overnight everything changed. The demand for Corn Belt products—meat, milk, eggs, and soybean oil—at home and overseas has increased vastly. The largest food production program in the Nation's history has been organized. Production goals for the 5 principal Corn Belt States call for 9 per cent increase in hog marketings and 15 per cent in the marketing of cattle and calves in 1942 as compared with 1940. They also call for 10 per cent more milk and eggs than in 1940. Soybean (for oil) acreage is to be increased 12 per cent above 1941.

Because of the great expansion possibilities of the Corn Belt and the already large farm production, a major part of the national goals for meat animals and soybeans will be supplied from this region. The possibilities for both success and failure in reaching goals are greater in the Corn Belt because of the number of alternative ways in which farm production lines can be combined.

Corn Belt farmers will try to make the maximum possible contribution to the war production program with the minimum maladjustment in soil conservation and overextended long-time investments.

The most difficult problem immediately ahead of Corn Belt farmers is that of fitting the large increase in soybean acreage, together with some increase in corn acreage, into the rotation without serious soil-erosion damage. This problem cannot be overemphasized and its solution should be approached on an individual farm basis. With our present knowledge of Corn Belt lands we know that on the level fertile soils the acreage of intertilled crops could be increased considerably without any harm to the soil beyond temporary lowering of fertility. On the other hand, on rolling land and on thinner soils too large an acreage of intertilled crops is now being grown, and any increase would cause further permanent injury of the soil. In general, farmers on the more fertile and level farms who will make substantial reductions in the acreage of wheat this fall and who can substitute soybeans for oats grown as a cash crop should be among the first to expand the acreage of soybeans.

Corn Belt farmers who have been progressively increasing their acreages of hay and pasture crops as a part of a soil conservation program now have an opportunity for working out the internal

farm-adjustment problem of providing a better utilization of this forage. With continued high prices for meat animals, farmers can utilize this additional forage by maintaining the numbers of roughage-consuming animals—beef cattle, dairy cattle and sheep—at high levels. Good foundation herds should be preserved by careful culling and replacements from young stock. Consideration should be given to the economy of using relatively more roughage and less grain in cattle feeding operations as a means of saving grains for pork, milk and egg production.

Although prospective prices of meat animals suggest that Corn Belt farmers who have dual-purpose herd will have little incentive in the next few years to increase substantially the production of dairy products, there are many small farms in the border areas and interspersed throughout the region on which operators recognize the need for a more intensive livestock enterprise as a step in long-time farm planning. Dairy cow numbers should be gradually expanded and heavier feeding practiced on these farms. On the many well-established dairy farms in the Corn Belt, it will be desirable and profitable to expand dairying by heavier grain feeding in view of the mounting demand for dairy products.

The present prospects are that hog production in the Corn Belt will keep pace with the increasing demand for pork products and lard if vegetable oil crop goals are met and if feed grain production can be increased by temporarily shifting some acreage to higher-yielding crops on level fertile farms and an expansion of soil-building practices on all farms. Furthermore, feed supplies can be made to go much farther in livestock production by giving more attention to feeding and sanitation practices.

Corn Belt Readjustment over the Long-Run

Immediately after the war Corn Belt products will continue to be needed for the rehabilitation of both our allies and our enemies. But after the rehabilitation years, our exports will undoubtedly fall off from the levels reached in the war years.

Even assuming more international cooperation, the Corn Belt probably cannot expect a very large permanent export market for its products. Some lard and pork may find an outlet on the European continent but the quantities are not likely to be large. In the main, Corn Belt products will find their future outlet in the home market. The long-time domestic demand situation will probably favor beef and dairy products somewhat more than hogs.

Chief among the longer-time problems on a great majority of Corn Belt farms is the problem of making effective use of large supplies of roughages and pasture. The traditional practice has been to utilize a major part of these feeds by raising beef cattle. The opportunity cost of marketing these feeds in this manner is the possible returns from dairying on the more intensive side and from sheep raising on the less intensive side. In limited areas where these feeds, especially the pasture, are meager and of low quality, sheep tend to crowd out beef cattle. In larger areas, because of the proximity of whole milk markets or because of certain characteristics of the cropping system, considerable attention is being given to dairying. But throughout the greater part of the region these otherwise unmarketable feeds are being used for raising beef cattle.

Characteristically, the general cattle enterprise on Corn Belt farms has shown less technical improvement and has been given less economic consideration than any other. Yet as a source of the feeder cattle that are grain fattened and marketed from the region, it is much more important than the more conspicuous movement of feeder cattle from the western ranges into Corn Belt feedlots. With the prospect that somewhat more range cattle will be fattened on irrigated farms and elsewhere in or nearer the range areas, Corn Belt feeders may have to depend even more in the future on farm-raised or native feeders. Judging by somewhat limited observation, a vast improvement could be made in the quality of breeding herds and in the conservation and use of the forage feeds for feeding these herds.

The South

Half the farm people of the United States live in the 13 southern States. In 1940 these southern people operated about one-third of the Nation's farm land and received only one-fourth of the cash farm income.

Overshadowing all else in the South has been the reduction, since the late 1920's, in cotton acreage, production and cash income. In recent years cash income from cotton, exclusive of Government payments, has averaged less than one-half the cash income from 1925–29. Hence this discussion will deal chiefly with the 10 principal cotton States.[3]

[3] The 10 principal cotton States referred to are: Alabama, Arkansas, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, and Texas.

Before 1926 the long-term trend in cotton acreage had been upward. During this expansion, the centers of production were gradually shifting.[4] The Coastal Plains and Piedmont sections reached their peak during the 1910–20 decade. In the following decade, cotton acreage and production were nearly doubled in the Mississippi Delta and western cotton areas. Production in the hill areas west of the Mississippi and the Black Prairies of Texas expanded rapidly until about 1925.

In recent years the acreage has been influenced greatly by cotton adjustment programs. Cotton acreage has declined about 40 per cent since the late 20's, but cotton production has fallen less because of rising yields per acre. Areas which can use fertilizer and winter legumes effectively are contributing an increasing share of the total cotton output.

Tobacco and wheat in the South have a different record. Boll weevil damage to cotton in the early twenties stimulated tobacco production in the eastern Coastal Plains, Upper Piedmont, and southern Appalachian areas. Expanding cigarette consumption here and abroad has provided a larger market outlet for flue-cured tobacco. In contrast to the general upward trend the acreage of fire-cured and dark-air-cured tobacco has been greatly reduced during the past 20 years and additional reductions seem inevitable. In Oklahoma and Texas wheat acreages trended upwards, reaching a peak in 1938. Mechanization, lack of profitable alternatives, and low yields from feed crops have been causal factors.

The urban population of the South increased more than 70 per cent in the last 20 years. This growing population has provided an expanding outlet for livestock and other food products. Expansion in diversified farming has long been regarded as a promising possibility for Southern farmers, but progress has been slow. Vegetable and truck acreages in the South have tended upward for nearly two decades, but many cotton farmers are not so situated as to benefit from this alternative. In recent years, the sale of livestock products has made up one-fifth of the total cash income in the 8 eastern States, and over 40 per cent of the total cash income in Oklahoma and Texas. During the past two decades, livestock numbers have gone down with cotton expansion and up with cotton contraction. Net increases have tended to persist from cycle to cycle in all classes

[4] See discussion in Regional adjustments to meet war impacts. U. S. Dept. of Agr. October, 1940. Especially page 17.

of livestock except hogs. The upward trend has been especially evident in numbers of milk cows.

The shift toward dairying and livestock has taken place mainly in areas where feed production possibilities are best. Cattle numbers are now at or above 1920 levels in most of the western cotton areas, the Black and Gulf Coast Prairies in Texas, the western hill areas, the Brown Loam area, and the Black Prairie Belt of Alabama and Mississippi.

Among the minor-cash crops, peanuts and soybeans have shown definite expansionist tendencies. Peanut expansion has occurred principally in the eastern Coastal Plains and the Sandy Lands of Texas and Oklahoma. Acreages of soybeans for oil are increasing rapidly in the Tidewater and Coastal Plains sections of North Carolina and Virginia, and in the Mississippi Delta. Recent expansion in timber cutting is resulting in depletion of woodland sources that will have to be rebuilt in the future.

Mechanization has proceeded less rapidly in the South than in most other regions. Nevertheless, it has had a definite influence on the average size of farms, especially in the western Cotton Belt. For example, about 50 per cent of the motive power for producing cotton in the western dry areas and in the Black and Gulf Coast Prairies is mechanical. By way of contrast, 90 per cent of the power in hilly areas and in the Piedmont and Coastal Plains is still supplied by horses and mules.

Southern agriculture is now in a transitional period. With the shift toward more extensive enterprises and mechanized production the average size of farm has increased. However, farms are still small and farm incomes low. In many areas alternatives to cotton have not been fully developed. Increases in hay and forage have been stimulated through the awakened interest in diversified farming and soil conservation, but in many sections erosion is serious and good quality roughage inadequate.

For the future, present trends toward industrialization and a larger urban market in the South are expected to continue. Long-term market outlets for cotton are not generally expected to be much above recent levels. Exports will probably face continued competition. Domestic consumption of cotton for clothing and industrial uses may increase but expanding use of synthetic fibers is likely to be an offsetting influence.

Although the total cotton production is not likely to expand ma-

terially, continued shifts between areas are to be expected. Under existing legislation, however, these shifts will probably be much slower than in the past. Decreases will occur only when the absolute advantage to the farmer is greater in some other crop. Under the program the farmer who is planting his allotment to cotton can increase his production only at the intensive margin. Greater flexibility in farm programs to secure better utilization of resources and improved distribution of benefits would seem probable in the long run.

Recent regional studies indicate that for the region as a whole, an increase of over one-third in cow numbers and approximately one-half in milk production, would be compatible with increased farm incomes and conservation of resources.[5] Increases would also be anticipated in other cattle, chickens, and hogs. Production of commercial vegetables, truck crops and flue-cured tobacco were likewise expected to increase.

Pastures still represent the worst bottleneck in obtaining needed feed production. Improvement in pasture is probably more important than extension of the pasture area. Perhaps during the next decade low cost methods of improvement will be developed. Results of recent experiments indicate that light fertilizer applications on pastures return the most for the money spent.[6]

Other major regions in the United States have little to fear from southern agricultural competition in dairying or other livestock production provided the industrialization of the South continues and accompanying improvements in standards of nutrition are made. The production of milk per capita in the 10 principal cotton States is only about one-half the per capita production in the rest of the United States.[7] Although post-war adjustments in demand for soybeans and peanuts for oil probably will occur, the acreages of these crops will probably remain at higher levels.

The shift from cotton to more extensive enterprises will require additional land. Present trends toward mechanization are expected to continue and will release some land for increased food and livestock production. Additional land of about the same quality as that

[5] For fuller discussion see: Farm adjustment in the Southeast to meet defense needs and Farm adjustment in the South Central States to meet defense needs and post-war conditions. U. S. Dept. Agr. BAE. November, 1941.

[6] S. E. Johnson, Should the South shift to livestock? Address at Regional Grassland Conference. U. S. Dept. Agr. BAE. 1941 (Processed). P. 9.

[7] Unpublished data. U. S. Dept. Agr. BAE.

now used appears to be available in many areas.[8] Total farm land area in the 10 principal cotton States has increased about 8 per cent since 1930. But even if means are evolved for utilizing all land resources, the per capita land resources in the South are smaller than in the North. They are not sufficient to allow a complete shift to a livestock or forest economy.

Eventually, an important part of the solution to low farm income will be found in nonfarm employment. Continued urban development in the South will help to drain off the excess farm population and help make possible larger farm units and higher per capita income. The amount of shift to nonfarm employment needed will depend in large part on the nature and extent of opportunities for farming adjustments in each area.

The West

Farm production trends in the West must be studied against the background of its settlement history and the recent impact of depression and drought on a farm economy not yet adjusted to the productive capacity of its resources. In the Plains States the farm units which were first established were inadequate in size. A trend toward larger operating units soon developed which will be continued if a stable and satisfactory agriculture is to be achieved. Similarly, in the Range and Pacific Coast States, readjustments in farm sizes have followed early settlement.

Contrary to popular opinion the breaking of sod in the West during World War I was but a continuance of a trend begun in the nineteenth century. The great expansion in wheat acreage in the Plains States came not during World War I but later on in the twenties. It was closely associated with the development of power machinery.

Dry weather in the thirties brought wide acreage fluctuations. Seeded wheat acreage in the Plains and the Pacific Northwest declined sharply from 1928 to 1934 and then advanced to an all-time high in 1938. Since then it has fallen off nearly 10 million acres, much of which has remained idle.

Because of dry weather, relatively high wheat yields, and low corn yields, a pronounced eastward movement of wheat displaced about eleven million acreas of corn in the Eastern Plains States

[8] W. F. Watkins, Toward a conservation balance. Land Policy Review. May-June, 1940. Pp. 20–26.

after 1932. With more favorable weather, corn and feed crops are likely to replace much of the wheat acreage in these eastern areas.

Numbers of cattle in the West have shown a long-time upward trend since the turn of the century. But a drastic reduction in cattle occurred from 1934 to 1937 because of protracted drought, the preceding loss of range to wheat, and the failure to provide adequate feed reserves. Since 1937, numbers have again increased and are now approaching pre-drought levels.

Numbers of milk cows, sheep and hogs have also shown an upward trend since 1900. Since the reductions following the 1934 drought, all have recovered except hogs which remain low. A further recovery of livestock numbers can be expected as the war effort stimulates the production of corn and other feed crops on land formerly seeded to wheat.

Wheat has been the backbone of the agriculture in much of the Plains and Pacific Northwest for nearly a quarter of a century. It will doubtless continue to be so in those sections having their greatest advantage in the production of wheat and where wheat production is sufficiently dependable to form the basis for a stable agriculture. But export markets for American wheat have virtually disappeared and domestic demand is not likely to warrant wheat production on a scale comparable to that of the last decade.

For much of the land that has been seeded to wheat, the best alternative uses are feed crops and grass. But in some of the western sections of the Plains and especially in the Pacific Northwest, wheat produces more feed per acre than any other crop. In such areas wheat production may continue and provide the basis for a livestock enterprise. If the price of surplus wheat should justify its use as a livestock feed, permanent dairy, poultry, and hog enterprises could become established in these sections.

Trends in livestock numbers in the range States have been similar to those in the Plains. Drought in the thirties scorched the range as it did the wheat lands and overstocking and inadequate feed reserves and water facilities took their toll.

Since the drought there has been a definite trend toward conservation of the range. Encouraged by Federal programs, ranchers have improved grazing practices and water facilities. The acreage of hay and other feed crops has increased as has the proportion of high yielding and high quality hays. More mineral supplements are

now fed to range cattle and sheep and feeding practices are generally better. But despite this, there now appears to be imminent danger of overstocking. Livestock numbers have increased since the drought to a point where much of the range is stocked at or beyond its carrying capacity and a continued increase in livestock numbers may bring ranchers face to face with another 1934.

A shift toward marketing cattle at younger ages has resulted in an increase in the proportion of range cattle in breeding herds. There is, therefore, somewhat less flexibility in operations and more likelihood of a forced liquidation of breeding herds in years of limited forage production.

The upward trend in milk cows in the West has been most marked in California and the Pacific Northwest. The development of new dairy areas is expected as some of the new irrigation areas such as the Columbia Basin are brought into production.

Milk production in the Pacific States has increased faster in recent years than the number of dairy cows because of better management of dairy herds and better pastures, particularly in irrigated areas. However, the Western States remain a deficit area for dairy products and wartime expansion in dairying seems likely to be absorbed with little trouble in the post-war period.

Poultry production in the West is mainly concentrated in the three Coast States. During the twenties and early thirties, large quantities of eggs were shipped to eastern markets. In recent years, perhaps because of increasing competition from eastern poultrymen, these shipments have fallen off and more of the production has shifted to poultry meat which has shown an improved demand. Some further shift along this line may occur if feed prices do not get too much out of line.

The occupation of cutover and irrigated land near the Pacific Coast is continuing. The need for such land will increase as operating units in the West are adjusted more nearly to the productive capacity of the resources; it will be magnified following the war when defense workers return to the land. It is likely that the development of such areas will be retarded during the war emergency and then accelerated during the post-war period of adjustments. Although the old western frontier is gone, about 100,000 farm families may fine new homes in the irrigated and cutover areas of the West during the next quarter of a century.

National and International Adjustments

The key to the long-run future of American agriculture lies in the kind of peace that will follow this war. A repetition of the international trade experience between World Wars I and II now seems very unlikely. Let us hope that political and economic isolation as a national policy went down forever at Pearl Harbor. Closer international economic collaboration and especially more attention to the basic food, clothing, and shelter needs of the great masses of mankind would seem to be one of the most probable economic consequences of allied victory. Fresh from the experience of total war and with lend-lease operations and food stamp plans as living examples, we shall indeed be lacking in vision and inventive ability if we cannot extend and develop similar programs on an international scale in the post-war years. The "economic co-prosperity spheres" of tomorrow should be universal—not national, nor even hemispheric.

More international economic collaboration in the future does not mean the return of free trade in the old sense. But it does mean a larger volume of trade between nations and regions than in recent years and an exchange of goods planned to meet people's needs rather than for purposes of exploitation. In the English speaking nations, the war has already served to emphasize the need for great changes in the diet and nutrition of the whole people. Since 1920, nutritional knowledge has vastly expanded and the ordinary food in the most advanced nations is much improved. But even more remains to be accomplished before practice approaches existing knowledge.

The great post-war agricultural programs both at home and abroad must be planned primarily to meet the nutritional and clothing needs of the people. The present agricultural programs have some significant features looking in this direction, notably those of surplus disposal. Other desirable results have been partly unintentional as, for example, the influence of the agricultural conservation program in increasing feed production and, indirectly, the production of roughage-consuming livestock. But in the main, the present programs have laid their greatest emphasis on protecting the short-run interests of producers. In the "food-for-freedom" goals for 1942, we have the beginning of a new line of policy which may well be continued into the post-war era.

We must be careful not to misinterpret the agricultural meaning

of a greater volume of world trade and greater stress on proper food and clothing for ordinary people everywhere. Although this will probably mean more prosperity to American farmers, the major benefits will come indirectly through greater domestic purchasing power. For such commodities as wheat and cotton, formerly so important in our total agricultural export trade, it appears that surplus producing areas in other parts of the world have been increasing their relative advantage. Hence, although world trade in those commodities doubtless will increase, American producers may not have so large a share in it. On the other hand, it may be possible that a more rational peacetime realignment of the central European market for pork and lard would directly benefit our hog producers. On the whole, our exports of agricultural products would, perhaps, form a smaller proportion of all exports simply because of the continued American trend toward urbanization and manufacturing. Manufactured products will probably form a larger share of both our exports and imports in the future.

Further urbanization in the United States is expected to absorb greater quantities of livestock products, fruits and vegetables. The presence of this general expansion in demand will prevent the development of many troublesome interregional problems. In the South, for example, where considerable expansion in dairying and other livestock is anticipated, all of the increases will be needed to make up present deficiencies in southern diets.

Northern dairymen have more reason to prepare for dairy expansion in the Corn Belt than in the South for the Corn Belt is probably the region with the greatest elasticity in productive capacity. Wisconsin dairymen should be very much interested in the reopening of European markets for pork products and in the development of bacon-type hogs and improvements in beef cattle production that will outcompete dairying in the Corn Belt.

Meats, in general, present a number of regional possibilities. Lard and bacon-type hogs represent only one problem. In beef cattle, changes in the production of feeder cattle in both the Corn Belt and the range country may affect the competitive position of these two regions in future cattle production.

Fruits and vegetables present a highly diverse and competitive picture. The general upward trend in consumption has included and will continue to include divergent tendencies. Some products tend to be replaced by others. Apples and potatoes, for example, have

been replaced in part by a greater variety of other fruits and vegetables. Nutritionally, some of these substitutions should, perhaps, go even further. The development of quick freezing is one in a long line of innovations that is likely to keep the fruit and vegetable picture changing. In general, the more southern areas have been gaining because of advantages in filling out formerly off-season periods, but quick freezing may influence this situation. Even in the northern producing areas there will be further tendencies toward concentration in favored areas.

Although most of the developments suggested above are hopeful for future agriculture, there are some phases of the prospect that will require careful thought. For one thing, we cannot expect to have a satisfactory national food policy unless the gains from new technology can be passed on to consumers in the form of lower prices as these become possible through increases in efficiency. And this means not only surplus disposal, penny milk schemes, and the like which reach the lowest income strata, but it also means lower prices in the open retail market which reach others as well. We are all citizens and we should all share in the gains of technology.

This means that all internal trade barriers that are not really necessary to the general public interest should be examined with a view to their eventual elimination. It means also that attention can well be given to modification of the concept of farm parity in the direction of parity income and to governmental support for parity income conditioned on production adjustments that will contribute most to the desired nutritional goals. The regional implications of parity income also present problems to be faced in the future.

The pressing needs of war have already broken barriers surrounding many innovations that would have become available much earlier had not interested groups feared the possible price effects on higher valued competing products. Dry skim milk and dried eggs, for instance, are two inexpensive foods that are likely to have much wider use in the future. Wartime labor shortages are very likely to overcome the resistance to the change from expensive daily doorstep delivered milk to lower-cost, self-service store milk.

Farmers and distributors who are able to adjust themselves to the new technology by improving their efficiency should have little difficulty, but those who are unable or unwilling to do so will be adversely affected.

To sum up in a few words, the probable long-run future prospect

appears generally hopeful for agriculture in all regions if we are all wise enough to follow through with the right kind of peacetime planning for food, clothing, shelter, and other basic needs of man.

DISCUSSION BY WALTER W. WILCOX*

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Frankly, I am going to attempt to dramatize the four or five major factors at work changing the volume and character of Iowa and Corn Belt agricultural production at the expense of giving you a well rounded dis-

TABLE 1. MISCELLANEOUS DATA FOR ILLINOIS, INDIANA, IOWA AND OHIO 1928–30 AND 1938–40

	1928–1930		1938–1940	
	Acres Thousands	Production Million Feed Units	Acres Thousands	Production Million Feed Units
Corn	28,107	982	25,275	1,187
Oats	14,406	254	10,881	192
Soybeans	543	10	3,446	61
Alfalfa	936	46	2,336	93
Clover and Timothy	8,435	189	5,815	121
Soybean hay	—	—	2,137	54
Total feed production		1,915		2,182
Net change in feed units concentrates				+204
Net change in feed units roughages				+65
	Number (000)		Number (000)	
Horses and Mules	3,273		2,398	
Tractors	231		397	
Milk Cows	3,906		4,301	
Pigs Saved	29,377		31,866	
Pounds Cattle produced	2,283,000		3,025,250	
Pounds Milk produced	17,302,000		19,605,000	
Number Eggs produced	8,171,000		8,136,000	

cussion comparable with the one you have just heard. The things I will stress and interpret for you are:

(1) The rapid increase in tractors and decline in horses.
(2) The increase in corn production due to the use of hybrid seed.
(3) The rapid expansion of the acreage of soybeans.
(4) The rapid expansion of the acreage of alfalfa and use of agricultural limestone.
(5) The decrease in the acreage of corn and oats due to AAA.

In order to illustrate these changes I want to call your attention to some figures for the three year periods 1928–30 and ten years later in 1938–40 for the four corn belt states, Illinois, Indiana, Iowa and Ohio.[1] These states

* Journal Paper no. *J 980* of the Iowa Agricultural Experiment Station, Ames, Iowa, Project 708.

[1] All data, except for tractors, are from publications of the B.A.E. and A.M.S. The computations of crop acreages and production were made by T. W. Schultz and O. H. Brownlee. Data on tractors from U. S. Census.

are the heart of the corn belt and have not been subject to the ravages of droughts which, in recent years, have become habitual in Nebraska and adjacent states.

It is my thesis that with the possible exception of the decrease in corn acreage, shifts in all of the directions indicated would have taken place without the AAA. Without question by holding corn and oat acreages down a great stimulus was given to the expansion of soybeans. AAA soil building payments also have been instrumental in increasing the use of agricultural limestone and alfalfa. But the outstanding fact remains that AAA in most cases has merely speeded up shifts which new technological developments had made profitable. Moreover, with the exception of the hybrid seed corn influence and the reduction in corn acreage, profitable shifts are far from complete.

The number of tractors in Iowa has doubled in the last ten years. The increase for the four states listed above was 70 per cent. Associated with this increase in tractors was a 27 per cent decrease in horses. Most of this increase in tractors took place since 1936 and many of the farmers have not yet reduced their horses to the economic level. In this ten year period, however, the reduced horse numbers in these four states have released the feed from three to four million acres of land for productive livestock. This is four to five per cent of current production. How much farther will this trend go? The war will affect it, of course. But keep in mind that around 40 per cent of the farms, over 50 acres in size in Iowa and the other Corn Belt states, are still without tractors. While the number of tractors are not likely to double again, it is entirely possible that horse numbers will decrease another 25 to 30 per cent releasing another four or five per cent of our total feed production for other uses.

Little more needs be said about hybrid seed corn. It has been the largest single factor operating to increase corn production in spite of the acreage reduction program. But the adoption of hybrid seed corn is almost 100 per cent complete in the Corn Belt. Unless substantially higher yielding hybrids are discovered, no further increases in feed production can be expected from this source.

Soybeans are another matter. Starting from almost nothing 10 years ago soybean acreage has increased to a little more than one fourth the corn acreage in the four central states in recent years and continues to increase. When and where will it level off? There are several aspects of this. Soybean meal is an excellent source of protein for livestock feeding. A recent survey indicates that if we were to make up current protein deficiencies in livestock feeding from soybean meal, current production would have to be tripled.[2] Farmers do not appreciate the value of protein in their livestock rations in spite of years of education in this field. The survey mentioned above indicated that Iowa farmers were using only a little over half the recommended amounts of protein in 1939. If farmers generally appreciated the value of protein soy beans would be priced higher relative to corn than they have been in recent years. Farmers could well afford to

[2] More protein for livestock by Wilcox, Parsons and Burton, Iowa Farm Economist, December, 1941.

pay up to two and a half or three times as much per pound for soybean meal as for corn if the poultry dairy or hog ration is seriously deficient in protein. The oil has seldom been less than 5¢ a pound and is now around 11¢ a pound. Since corn yields in most of the level areas of the Corn Belt adapted to growing soybeans are less than three times as high as soybean yields, if soybeans were priced in line with their feeding and oil value, they would compete with corn on almost even terms from a cash value per acre standpoint. They will make further inroads on the oats acreage regardless of AAA. If AAA should push protein feeding to livestock, soybeans could profitably displace corn in many Corn Belt fields. Surely present soybean production will be doubled in a few years—the increase might go even further.

If one studies the upward trends of acres of land limed and acres of alfalfa harvested it looks like we have made excellent progress in recent years. But if one looks at the distance yet to go to achieve any reasonable goal the self-satisfied feeling soon disappears.

The alfalfa acreage in the four central Corn Belt states in 1938–40 was about the same as the soybean hay acreage and less than half the clover and timothy hay acreage. The alfalfa acreage could profitably be doubled or perhaps even tripled. Liming could profitably be increased to three or four times recent years' accomplishments. The 1941 changes in AAA will facilitate these increases. Without an AAA program, the upward trend would be slowed down. But the trend will continue in the same direction regardless of AAA activity.

These statements briefly summarize the major changes in crop production in the Corn Belt, the reasons for them, and the extent to which the same influences may be effective in the future. Changes in the technology of livestock production have not been so important.

Disregarding the corn sealing program which merely gives us a different time distribution in the utilization of crops grown, and the droughts in the Western Corn Belt, it seems clear that recent technological changes have increased the Corn Belt's capacity to produce livestock. The increased capacity comes from three sources: (1) release of feed from power production (horses), (2) substitution of the production of protein concentrates for concentrated carbohydrates (corn and oats), (3) substitution of legume forage for non-legume forage.

It seems probable that increased protein in the ration is an important factor in accounting for the increased milk production per cow and egg production per hen in recent years. It has saved corn in pork production, too. Although total feed production only increased 15 per cent between the two periods compared, the increased protein in the rations and the four to five per cent of the feed released by horses makes possible around 20 to 22 per cent more livestock production without any improvements in animal breeding or sanitation.

Although a part of this increase in feed production was due to better weather, I see no reason why present trends in growing more soybeans and alfalfa, and using more lime and fewer horses will not continue so that the present 20 per cent increase in feed resources for productive livestock in the heart of the Corn Belt could be maintained and increased. Better

weather in the Western Corn Belt, shifting of present corn belt wheat land to feed crops, and contour cultivation of row crops would give us a substantial further increase in livestock feed.

Now, just a few words about what this means for particular kinds of livestock production:

Dairy cow numbers and production per cow can be expected to continue to increase. Good roads, electricity to run mechanical milkers, less field work due to the tractor and more owner operated farms all favor increased dairying. Increased alfalfa and soybean production operate in the same direction. Our studies have repeatedly shown that a high producing dairy herd is the most profitable manufacturing plant if the raw material is largely legume hay and pasture.[3] The price ratios between dairy products, beef and hogs would have to be unusually unfavorable to stop the present trend. Milk production has increased one third in Iowa in the last 16 years. But as in the case of alfalfa and soybeans, the physical resources available and the economic returns from feeding high quality roughages to dairy cows as compared with beef cattle suggest that the future increase in dairying in the Corn Belt will be substantial. An AAA program which speeds up the liming of our soils and legume and soybean production may increase the rate of adoption. But the competitive advantage clearly favors dairying over a wide range of price changes. The trend will continue regardless of AAA.

One final point. Effective implementation of a good neighbor policy may call for permitting Canadian, Mexican and South American farmers to compete with us on more nearly even terms in beef production. If this happens and our government, in the interests of nutrition subsidizes milk consumption for children, the economic incentive for shifting from beef to dairying may be even greater than it has been in recent years.

Poultry production will depend on relative prices. It is significant that poultry numbers dropped and egg production was just maintained during this period.

Now we come to the question of beef vs. hogs in the utilization of grain. Recent years have witnessed a widening of the spread between hog and fat cattle prices. One factor which will operate to make this continue in the post war period again will be the weak competitive position of lard due to the large amount of vegetable and marine oils available. However, beef cattle in the corn belt use only around 15 per cent of our grain as compared with 40 to 45 per cent used by hogs. At least in the short run when we have plenty of purchasing power relative to our total meat supplies, hog prices and hog production may be expected to be relatively favorable to cattle prices and production.

DISCUSSION BY J. A. HODGES

Kansas State College

When one realizes that more than 40 per cent of the farm land in the United States is located in the 15 western states and that the area can well

[3] See Using hay and pasture for profit, by Nelson and Wilcox, Iowa Farm Economist, April, 1939.

be subdivided into a number of type-of-farming areas, it is evident that a brief discussion must be spread rather thinly if an adequate coverage is to be obtained. For this reason, I will attempt only to emphasize or supplement some of the points made and to suggest a few others which appear worthy of consideration.

A little further emphasis on income might be in order since a number of adjustments arise from changes in income just as changes in income result from adjustments. Taking cash income and government payments as an index, income tended to increase from 1932 to 1937 although marketings in some years were increased by sales of livestock, forced by drought and lack of feed. After a decline in 1938, income again increased until 1940, the last full year for which figures are available. In a comparison of the first nine months of the year the increase was substantial for 1940 and 1941 compared with 1939. For the first 9 months, income in 1941 compared with 1940 by states increased from 10 per cent in Nebraska to 47 per cent in Kansas. For the 15 western states, it amounted to approximately 25 per cent—about 1 per cent more than for the country as a whole. The relative changes for the Pacific, Mountain, and Eastern Great Plains regions were similar in degree. Over the entire period, increases in income arose from a number of factors, including better yields, higher prices, and government payments. As was pointed out by Mr. Stewart, the income in recent years has been divided among fewer people, especially in the Eastern Great Plains where population outside cities has shown a considerable decrease. Farther west, particularly along the Pacific Coast, the population outside cities has shown a substantial increase.

Farmers' response to price or income is limited or influenced to a certain extent by allotments, quotas, goals, and the like. However, the increasing income over a period of several years gives an impetus to increased volume of business, part of which takes place through increased mechanization. Furthermore, mechanization has a greater comparative advantage during times of high prices and good yields, both of which tend to increase volume of business. In the wheat belt, where this mechanization is largely in the form of tractors and tractor-drawn equipment, the effects of a few such years may extend over a fairly long period. Experiences of the depression indicate that tractor and tractor equipment may be used a number of years longer than was intended by the farm operator at the time of purchase. The increased mechanization will add to the inflexibility of adjustments through increased fixed charges and will increase the pressure for larger sized units.

I would like to emphasize the statement that "the trend in the average size of farms sometimes obscures the true nature of events." For example, the trend in the average size of farms for the 15 states from 1920 to 1940 shows an increase of about 23 acres every 5 years. Divided into sections, the Eastern Great Plains (N. Dakota, S. Dakota, Nebraska, and Kansas) shows an average increase of 12 acres every 5 years; the Mountain States, an increase of 76 acres every 5 years; and the Pacific States, a decrease of 1.3 acres—practically no trend. Both Washington and California farms were smaller on the average in 1940 than in 1920 and those in Oregon were smaller in 1940 than in 1930. However, one can gain little by averaging the

farms for Washington, for example, including the large cash-grain farms of the Palouse, with the smaller farms of the western part of the state having a high percentage of dairy and poultry farms. In Kansas, the trend of size has been generally upward, but this has resulted from several movements. In the twenties, the intermediate sizes increased in acreage. Some of the larger units were broken down and some moderately small units were combined or absorbed. In the thirties there was some increase in the number of small farms, but the intermediate sizes continued to become larger in area. It appears to me that this increase in acreage of the intermediate sizes may be of considerable importance over much of this western area in the next few years.

In stressing the tendency for the increasing size of farm, two factors should be emphasized: (1) Much of this increase can take place without disturbance of the traditional "family-size-farm" concept since technological advances have increased the possibilities of this unit; and (2) it may not interfere seriously with a considerable proportion of smaller sized units always needed to round out the economic needs of members of an established community. However, this does not mean that there will not be considerable shrinkage in the number of agricultural workers needed on the land.

In considering the adjustments in recent years, the work of the plant breeder and other biological specialists has received scant attention except in regard to hybrid corn, which is the outstanding example. For part of the Great Plains, the introduction of "combine" grain sorghums probably has been even more significant since it has increased the possibilities of using wheat equipment, thus making more economical the production of feed crops where alternatives to wheat production have been scarce. In the same category is the introduction of earlier maturing varieties and the gradual pushing northward of grain sorghums. For limited areas, the introduction of such hybrids as atlas sorgo, which has a sweet stalk and good grain, has given an alternative for corn—particularly for silage on the western fringes of the Corn Belt where yields of corn have been poor and irregular for a decade. Just when additional significant advances of the plant breeder will occur is not predictable, but in looking forward to future adjustments the probabilities along this line should not be neglected.

The increasing use of irrigation has been mentioned both on such projects as those in the Pacific northwest and for increased use of home gardens. Not so much attention has been called to the increasing use of fallow. While used most extensively for wheat it has been used in a more limited way for feed crops. If the stabilization of more livestock in much of the Great Plains is to be accomplished, increased use of fallow for feed crops in connection with increased storage facilities probably will occur.

The more difficult problems of the area do not appear so much in the immediate future, even with the attempt to reach goals with diminishing labor supply and increasing costs, as in the middle distance of post-war adjustment. The power of reabsorption of surplus industrial workers, without serious difficulties, appears decidedly limited.

In closing, attention should be directed to the possibilities of agricultural planning as an aid in the adjustments in population, farm enterprises, and

community developments which confront different parts of the western states in varying degrees. The 15 western states have 729 counties, 81 per cent of which have some type of agricultural planning, either on the basis of the community, county, or county and community.[1] Forty-four per cent have both county and community planning. In the face of many limitations to what can be done, it is a clear indication of alertness to the problems and a more rapid response to necessary adjustments.

DISCUSSION BY J. H. MCLEOD

University of Tennessee

On the whole, I agree with the general picture and pattern of the future agriculture of the South which Dr. Mighell has visualized for this region; however, there are certain phases of this subject on which I should like to enlarge.

The fact that the acreage of the principal cash crop of the South (cotton) has been reduced by 22,000,000 acres during the period of 1930–40, and the further fact that the purchasing power of the crop has only averaged 66 per cent (based on the 1910–14 index) during the same period, gives the South its most difficult problem in readjustment since the Civil War.

Farmers of the South may be placed in two general groups: one consisting of the large operators, who usually have sufficient financial backing to make readjustments rather quickly, and the other composed of the small operators whose readjustment program must be kept in line with limited financial means. Both have similar opportunities for readjustment in the production of cover crops and erosion control practices through AAA benefits. Both in time will possibly add some livestock or crop enterprises. However, because of the smaller acreages of the farms in the second group, it is necessary that the more intensive enterprises be included in order to maintain the volume of business.

By and large the final patterns set for southern agriculture will depend upon the disposition of the 22,000,000 acres taken out of cotton and the improvement and use of idle lands and pastures, often consisting of old fields which have been abandoned because of low cotton yields but which have shown surprising response to lime, phosphate, and other fertilizers.

It is recognized that crops like soybeans, peanuts, vegetables, fruits, and timber, all have a part in the agriculture of the South and are of particular importance in certain local areas. However, due to the limited time, this discussion will be confined to enterprises with region-wide significance that will likely have the greatest influence on readjustments.

Beef Cattle Adjustments

The larger operator is already making rather rapid changes in his farm practices. He is improving and increasing the acreage of pasture, using beef cattle mainly as a supplemental enterprise to offset the diminishing returns from cotton. The ready acceptance of livestock in the farming program by the cotton producers is definitely indicated by the sharp upward trend in

[1] Operating Report of the Division of State and Local Planning covering the Cooperative Agricultural Planning Program for the year ending January 30, 1941.

cattle numbers from 1930 to 1940. The majority of the farmers producing cattle are of the opinion that the strong upward trend in cotton prices during 1941 is only temporary, and that continual readjustments in their farm programs will need to be made.

Lower prices for market cattle will have an effect upon numbers produced, and we may expect to see a downward trend in cattle population from the present high level when this occurs. However, with restrictions on cotton acreages, it is not likely that the drop in numbers of cattle will be as drastic as in former years during similar price recessions. The indications are that in the new agriculture of the South, the cattle business will be on a more permanent and stable basis than has been the case heretofore.

Corn and Hog Adjustments

The greater portion of the land made available by cotton reduction has gone into hay, small grains, pasture and corn. It will be noted that with the exception of corn all the crops mentioned have a soil protective value, which is an important factor in southern agriculture, particularly following years of high acreages in cotton with its resulting soil erosion. According to Dr. Mighell, from the standpoint of conservation, there is now too much land in corn and a part of this acreage could well be shifted to small grains, legume hay crops, and pasture. So far as the land is concerned, I fully agree; however, it is doubtful that this will happen in the near future. The corn crop, like the cotton crop, is the small farmer's stand-by. This crop can be made with the same simple farm implements used to produce cotton, and the crop can be gathered by hand, while more expensive equipment is required to harvest a grain or a hay crop. In many areas of the South a thresher is not available; then, too, a corn crop returns more cash per acre. All this is important to a small farmer with limited means, and the South is largely a land of small farmers. The corn acreage will probably be reduced over a period of years, but total production (taking recent indications into consideration) will probably be maintained through better soil practices.

Hogs, as a livestock enterprise for the small farmer, occupy about the same place in the farm program as that of corn. Swine can be produced in a limited way with a small outlay of cash and with little farm readjustment being required. Of course, pastures for hogs are desirable, but not essential. So far as fences are concerned, if woven wire is not available, the old picturesque southern type of rail fence can still be built, as small trees, suitable for such purposes, are usually available in most areas.

The swine population in the 15 southern states increased 4,400,000 from 1930–40, while in the remainder of the United States there was a decrease of 1,800,000 for the same period. This indicates the value placed upon this kind of livestock by the southern farmer during years of decreased cash income, and gives another reason why corn acreages are likely to remain relatively high until further readjustments take place in the agriculture of the region.

A part of the increase in hog numbers went to supply meat to farm families who had not formerly owned hogs, but had been accustomed to purchasing the home meat supply. The percentage of farmers reporting hogs and pigs rose from 57 per cent in 1930 to 68 per cent in 1940. With

the exception of Kentucky, these increases were most apparent in the strictly cotton states. The packing-house slaughter of hogs in Alabama from 1931–37 increased practically 50 per cent, and other southern states (from which data were available) showed material gains.

With steadily growing interest in the home food supply program, the indications are that the number of farmers in the South producing hogs will increase over a period of years. Because of the ease with which hogs can be increased or decreased, more fluctuation in numbers may be expected than in other kinds of livestock.

Reference has been made to mechanical power on the farm which is increasing slowly in many regions of the South but as yet is not an important factor in most areas.

Perhaps the farm motor trucks, combined with good roads and the radio, are having more influence in changing the agriculture of the region than are tractors and other power equipment on the farm. In the last decade motor trucks have increased 49 per cent, hard surfaced roads 47 per cent, and gravel roads 31 per cent. This gives to many the opportunity of marketing cattle, hogs, poultry, eggs, milk, etc., more quickly and to better advantage than heretofore.

Our animal husbandry specialist reports that livestock markets have increased 100 per cent in the last few years and that there is an increasing amount of livestock brought to the market in the afternoon after the farmer has heard the market quotations over the radio in the morning. Perhaps this is one of the reasons why the value of packing-house products has increased 92 per cent in nine southern states from 1923 to 1937.

Dairy Production and Adjustment

Of the many changes taking place in connection with the readjustment of southern agriculture, dairying is perhaps the only enterprise that might possibly offer competition to other regions of the United States. In this connection, I am using the word "possibly" with considerable caution. Long-time predictions are hazardous, but if cotton and tobacco continue largely on a domestic basis, the need for such an intensive enterprise becomes more apparent.

Since 1867 there has been a gradual upward trend in the number of milk cows in the South, but only twice during these years has the percentage of increase been greater in the South than in the United States as a whole. The first period occurred following the Civil War and the second from 1928 to 1937. In the first period it was a matter of replacements, and in the second, the result of an effort to replace the losses incurred due to low prices for other southern products. For example, the average purchasing power of cotton for 1930–40 stood at 66, as compared with dairy products at 87.

While the number of milk cows in the 13 southern states increased about 24 per cent during the period of 1928 to 1938, the total amount of milk increased only 16 per cent. This would naturally be expected in a region just developing its dairy industry. Some of this increase no doubt was used for home consumption, as the percentage of all farms reporting milk cows in the southern states increased from 63 to 74 per cent during the 1930–40 period.

The greater portion of the milk increase in the 13 southern states which went into commercial centers was evidently made into butter. From 1927 to 1937 there was an increase of 38,000,000 pounds in the production of creamery butter in the southern states, while in the remainder of the United States there was only 50,000,000 pounds' increase.

It is significant that the largest total increases in creamery butter for the 1930–40 period occurred in those states already reasonably well-established in the dairy industry, namely—Kentucky, Tennessee, Oklahoma and Texas. The greatest percentage of gains, however, took place in Arkansas and Louisiana.

According to USDA Technical *Bulletin* No. 751, comparatively small amounts of the increased milk products reached the northern and eastern markets. This is possibly due to two reasons:

1. Fifty-six per cent of all the milk produced in the South is consumed on the farm where it is produced, in comparison with 24 per cent for the United States, and 12 per cent for the five leading dairy states.
2. The urban population of the 13 southern states increased about 2,000,000 during the last decade and 7,000,000 during the past 30 years. The South has always been an importer of dairy products and can easily consume all increases made to date.

The Future Status of the Dairy Business

As mentioned heretofore, the South, as a whole, is a region of small farms. To maintain the fertility of the land and a reasonable income per family, some types of intensive enterprises, in combination with cover crops, must be practiced. Small acreages of cotton or tobacco, with a limited number of dairy cows, seem to offer the best solution.

The average small cotton farmer will make adjustments much more slowly than the farmers to whom I have just referred. He has, for a long time, worked with enterprises which did not require his attention from Saturday noon until Monday morning, with little or no labor involved between "laying-by time" and "cotton-pickin' time." The southern farmer has learned to value his leisure highly. This is not stated as a reflection upon him. All of us are creatures of habit, and if we had been reared under similar conditions we would think and act as he does. It is his habit of life, and habits are not changed over night. However, continued economic pressure must necessarily change attitudes, and, in time, such farmers will be forced to adopt a type of farming best suited to the land and his needs.

I do not agree with those who say that the lack of pasture is the bottleneck of livestock production in the South. There have been enough examples to show that this crop can be produced and produced well. The real bottleneck is the farmer himself. Whenever he reaches the point where he values grass—grass will be grown.

Besides the personal element which must be overcome as the first step toward increased dairy production in the South, there are many physical handicaps with which the farmer will have to deal. More fences will have to be constructed; new barns for milk cows must be built, or the old ones remodeled; pastures and hay will have to be provided, and general farm adjustments made to meet the needs of this new enterprise, even though it is undertaken in a limited way. The fact must also be kept in mind that

during a large part of the year the weather is so warm it is difficult to keep the milk from "souring." Electric refrigeration will help to remedy this condition. During the past 10 years there has been a 450 per cent increase in the number of farms served by electricity in 13 Southeastern states; however, the number to whom electricity is available is yet relatively small. Increases in dairy production may come about rapidly in the present established areas, but in new territories increases will come about more slowly.

If the trends in the last decade are any guide to the future, the big changes affecting the South will be increases in yields of cotton, tobacco, and corn, with increases in acreage and yields of small grain, hay, and pasture. This largely points the way to livestock. There is no doubt in the minds of the leaders of the South that livestock and livestock products will supplement the cotton and tobacco crops, with the greater emphasis on cattle and dairy products.

The question might be asked—What competition will these products offer to other regions? With growth in urban population of the South, and some prospect of increases in individual consumption, there seems at this time little indication that any of these products will be shipped from this region to areas in the North and Northeast; however, those sections which have been shipping beef and dairy products into the South may find (particularly with reference to dairy products) increasing competition with those produced within the region itself.

DISCUSSION BY L. C. CUNNINGHAM

Cornell University

The continued trend of farming in the Northern dairy region toward increased commercialization in dairy and poultry has been striking. The expansion of dairying has been much more marked in the Lake States than in the Northeast. The former is a much younger region agriculturally speaking. The most noteworthy development in the Northeast has been the abandonment of the lands unsuited to farming and the keeping of more dairy cows on the lands suited to permanent agriculture.

The statement was made in the paper "that the Agricultural Conservation Program has been instrumental in the last decade in stimulating an increased production of dairy feed, especially roughage." In evaluating these increases it should be remembered that this country has had five successive bumper crop production years, with the last—1941—the largest on record. Secondly, the stimulation of the trend has been artificial and, if I may say so, one-sided.

The authors of the paper conclude, as you will remember, that dairying in the Northeast has been artificially built up in some fluid milk sheds and a cost of production level maintained which could not stand open competition. Furthermore, it is concluded that removal of these "trade barriers" call for a reduction in dairying in the Northeast. Such statements raise many questions. How far can 100 pounds of fluid milk be shipped safely and economically? The freight differential at tank car rates between Fond du Lac, Wisconsin, and the 201–210 mile zone in the New York milk shed is about 65 to 70 cents per 100 pounds of fluid milk.

New York City is the only important closed cream market in the Northeast, yet the cream shipped from states west of New York and Pennsylvania probably amounted to less than 5 per cent of the total supply of milk and cream in the Northeast region last year.

Except possibly for cream in the New York City market, the fluid milk sheds have been developed generally on a competitive basis and on the sound principle that it is most economical in the long run to produce milk and much of the fresh cream near the markets in the Northeast.

If the authors of the paper question the sound development of the nearby fluid milk sheds, what would they say about the soundness of the tendency of the poultry industry in the Northeast to expand commercially? There are no barriers in this industry, yet the Northeast was the only region of the country to show an increase in poultry from 1930 to 1940, according to Census reports.

Even granting some trade restrictions on New York City cream, how does that advantage to the Northeast dairy industry compare with the agricultural conservation payments in recent years to the Lake States and northern Corn Belt? These government payments to some states were as follows:

GOVERNMENT PAYMENTS IN THE AGRICULTURAL CONSERVATION PROGRAM[1]

	1938 (000 omitted)	1939 (000 omitted)	1940 total (000 omitted)	1940 per farm
Wisconsin	$11,737	$19,417	$12,273	$ 66
Michigan	7,774	12,009	12,773	68
Minnesota	15,301	26,599	40,552	205
Iowa	29,719	69,444	49,235	231
Illinois	11,549	46,454	35,750	167
New York	3,682	3,265	6,211	41
Pennsylvania	2,757	5,723	6,679	40
Vermont	528	1,145	595	25
Massachusetts	407	633	619	19

[1] The farm income situation, February 1941

Is it fair interregional competition to make payments amounting to $150 to $200 per farm in some sections in the Midwest dairy area as compared with payments of only $20 to $40 in some Northeastern states. Is equal competition brought about by removing trade barriers in one area and at the same time making large government payments in another? Would not interregional competition in dairy products or other agriculture be placed on a more just basis by not only removing the trade barriers, but at the same time removing or at least equalizing the government payments?

These questions are not asked so much of the authors of this paper under discussion as of those in charge of the whole agricultural program. In fact, to the authors and their co-workers much credit is due for opening up this fertile field of research in interregional competition. Their work thus far has been both constructive and worth while. Many of the states would welcome, I am sure, the opportunity to do more research on a cooperative basis on the competitive advantages and disadvantages of these different regions.

AGRICULTURAL WORKERS AND SOCIAL INSURANCE

JOHN J. CORSON
Bureau of Employment Security

ONLY a little more than six years ago, the very phrase "Social Security" had a strange and unfamiliar sound to American ears. Before August 1935, no system of social insurance other than workmen's compensation existed in this country. Today, it is estimated that 40 million workers were employed at some time during 1941 in jobs covered by the Federal system of old-age and survivors insurance. Most of them are also protected by state programs of unemployment compensation. "*Social Security*" is now a household word.

But it is a word which still has no reality for many millions who work for a living—among them the farm laborer, the sharecropper, the tenant farmer, and the independent farm operator. These people have no social insurance protection against the economic consequences of old age, unemployment, and death. Why? Not because they don't need it. Their need for social insurance is at least as great, and in many respects greater, than the need of many groups already protected. No, the chief reason why agricultural labor has so far been denied protection is fear of the difficulties that would accompany efforts to administer a social insurance covering this group.

When the Social Security Act was passed in 1935, there were many who said that the old-age and survivors insurance program would not work. It is impractical, they said, to pay variable benefits related to individual and regional differences in earnings. It is impossible to collect contributions and obtain wage reports for millions of men and women scattered all over the United States, working for hundreds of thousands of small employers as well as for large corporations. It is inconceivable, they said, that there can be maintained complete and accurate records of individual earnings, over each individual's working lifetime.

Notwithstanding these predictions, nearly 60 million individual earnings accounts have been established and are being maintained. Without counting 1941 returns, approximately 117 billion dollars in wages have been reported by employers since the program began. Of this total, 99.5 per cent has been definitely identified and

credited to the proper individual accounts. Old-Age and Survivors Insurance contributions totalling nearly 3 billion dollars have been collected since 1936. In October 1941, less than two years after monthly benefits first became payable, more than 400,000 men, women and children received monthly benefit checks to replace, in part, the earnings cut off by old age or death. Practical solutions have been found for all the administrative problems which loomed so large a few short years ago.

In many other countries, social insurance is a going concern for agriculture as well as for industry. In Sweden, Finland and New Zealand, for example, the entire population is covered by social insurance. In Great Britain, France, Germany, Italy and Russia, social insurance protects persons employed in agriculture as well as in other fields. Spain and Chile are other examples of countries which cover agricultural workers. In fact, a large majority of the countries with established social insurance systems provide protection for agricultural workers.

In our own country, we have tended to place agriculture on some separate and mysterious plane where all sorts of unknown and formidable obstacles were to be expected. This attitude probably arose largely from our early and unsuccessful attempts to remedy the depressed economic conditions which, after the last war, beset agriculture so much sooner than other areas of our economy. At least in so far as social insurance administration is concerned, a fresh examination of agriculture in relation to other areas of employment already covered by such insurance may serve to dispel or minimize many of the bugaboos.

Of the 10 million gainfully employed persons in the whole field of agriculture, approximately 4 million are employees, in occupations now exempt from old-age and survivors insurance as "agricultural." As many as 4½ million persons may be employed in such occupations at some time during a given year. This group of workers includes perhaps 500,000 sharecroppers;[1] about 1,000,000 migratory workers; around 1,850,000 local seasonal laborers; and some 750,000 regular hired hands. Also included are approximately 100,000 farm managers, and at least 300,000 so-called "agricul-

[1] This group is sometimes classed with the self-employed. However, although numerous variations occur, the sharecropper as a rule brings little or no equipment to the land, and exercises little or no control over the use of the owner's equipment. In most cases, the existence of an employer-employee relationship could probably be found.

tural" workers who are performing work essentially industrial in character.

Administrative Problems

As we proceed from the beginning to the end of the above list, the administrative problems involved in social insurance coverage progressively diminish. The greatest difficulties exist in connection with the self-employed farmers. One of the chief problems in this area, for example, is that of arriving at a satisfactory concept of income for tax and benefit purposes.

In the case of sharecroppers, administrative problems are also relatively serious. Here, however, our experience to date provides some pertinent guides. The sharecropper group is characterized by indistinct and often tenuous employment relationships, and by payments in the form of crop shares rather than periodic cash wages. Neither of these characteristics presents anything that is fundamentally new and different in the administration of our social insurances. Borderline cases, where the existence or absence of an employer-employee relationship must be determined, are decided every day under present coverage. Crop shares are essentially payments-in-kind, and evaluations of payments-in-kind must be made under the present system. Modifications in existing law and practice will undoubtedly have to be made if the sharecropper is to be given effective protection. But there are good reasons for believing that procedures which "fit" the sharecropper can be devised and successfully administered.

When we come to the agricultural wage worker, the chief administrative problems differ from those already encountered under present social insurance coverage only in degree, and not in kind. The small employer having only one or two employees and unaccustomed to record-keeping is a frequent occurrence in trade and commerce. For example, approximately one-fourth of all employers reporting under the old-age and survivors insurance program for the last half of 1937 reported wages for only *one* employee. More than three-fourths of the total employer returns for the same period showed taxable wages for less than ten employees. Similarly, wages-in-kind are received by many industrial and commercial employees. Room and board is a customary part of the compensation of workers in restaurants, hotels, and sanitaria, to name only a few illustrations. Moreover, intermittent, seasonal, and migratory

work are familiar phenomena in the industrial as well as the agricultural field.

The problems arising from these factors have already been largely solved with respect to present social insurance coverage. Experience therefore justifies the belief that they can also be handled satisfactorily with respect to agricultural employees. Indeed, this is an understatement insofar as it applies to the so-called "agricultural" workers employed in work that is essentially industrial by large-scale employers—such as fruit and vegetable packing houses, or cotton gins. In this area, fewer administrative difficulties are involved than in many segments of present social insurance coverage.

However, I do not wish to minimize unduly the problems which must be surmounted if coverage for agricultural workers is to be successfully administered. Though they differ from previously solved problems in degree rather than in kind, the differences in degree are important. Census figures for 1935 indicate that of all farms reporting hired labor, about three per cent employed about one-fourth of all the workers reported.[2] This is a significant degree of concentration, but it is substantially less than the concentration in covered employment. Reports under old-age and survivors insurance for the third quarter of 1939 show that approximately three per cent of the total employers accounted for more than 60 per cent of the total number of employees. It may also be assumed that unfamiliarity with record-keeping is more widespread in agriculture than in industry.

Methods of Meeting These Problems

For these reasons, it seems desirable that some form of stamp system be used instead of the present method of quarterly pay roll reporting, to simplify tax collection and wage reporting in the agricultural field. Under a stamp system, employers would purchase appropriate stamps from the post offices from time to time. The face of each stamp would show its price and the amount of wages it represented. These would be pasted in the employee's stamp book when wages were paid. Half the price of the stamps, the employee's share of the insurance contribution, would be deducted from the wages paid. The employee's possession of the stamp book would permit him to check contributions and would help to insure com-

[2] See Wendzel, Julius T., "Distribution of hired farm laborers in the United States," Monthly Labor Review, Sept. 1937.

pliance. The stamp system would be integrated with the present system of pay roll reporting. To permit greater flexibility, employers might be given the option of using either the stamp method or the present system of quarterly pay roll reporting.

The importance of payments-in-kind is also much greater in agriculture than in commerce and industry. It is estimated that even in the case of agricultural workers other than sharecroppers, roughly one-third of the annual wage bill is met by payments-in-kind. In individual cases, of course, the proportion may be much higher. The evaluation of these payments might be simplified by the use of regional schedules issued periodically by the Social Security Board, wherein the approximate value of various forms of such payments would be set forth. If a wage-class system were adopted for agricultural workers, it might be possible to ignore wages-in-kind entirely.

There is every reason to believe that the administrative problems involved in the coverage of agricultural workers can be solved. Yet this does not imply that perfection can be attained over night. Even the best administrative arrangements cannot be expected to eliminate entirely the problems of delinquency, tax evasion, and incomplete or inaccurate wage reporting. Particularly in the early years, these problems are likely to loom relatively large. However, improvement will come with education and experience, as it has in connection with the groups now covered.

When the first earnings reports under old-age and survivors insurance were received, for the year 1937, it was found that more than 10 per cent of the individual earnings items were incompletely identified. Special research and investigation were necessary to determine the proper employee account to which these items should be credited. Today, after only a few years of experience, the proportion of earnings items which are reported with incomplete identifying information has been reduced to less than two per cent. The task of educating employers and workers as to their rights and responsibilities under social insurance will probably be greater and slower of accomplishment in the agricultural field. That is the more reason for starting the job as soon as possible.

Attitude of Agricultural Employers and Economic Considerations

One important consideration in any discussion of social insurance coverage for agricultural workers is the attitude of the farmer-

employer. How will the small employer, especially, feel about paying contributions for the protection of his hired hands, particularly if he himself is not covered? Resentment against this situation is frequently expressed by self-employed persons in commerce and industry. It may be that social insurance protection for the self-employed farmer is an essential corollary of workable protection for the agricultural employee. The likelihood of this attitude is but one of the reasons why social insurance should be made available to farmers as well as farm laborers, despite the greater difficulties involved in the case of the self-employed.

The argument is frequently advanced that agriculture is in no economic condition to bear the costs of social insurance contributions. However, agriculture already bears a considerable part of the costs of public and private dependency, both directly and indirectly. In the long run, these costs will be substantially reduced by social insurance protection. Over a period of years, therefore, not all of the contributions to an insurance program will constitute a net addition to taxes or dependency costs.

In the short run, it is true that the pay roll tax may be burdensome in some cases—for example, to the operator of a small farming establishment such as a truck farmer or dairy farmer who nevertheless employs considerable labor. However, compared with the basic conditions at the root of agricultural troubles, such as the decline in export markets and the rapid trend toward mechanization, a moderate pay roll tax would be a minor factor. In most cases, agricultural employers would probably be able either to absorb the employer contribution or to pass it on in the form of higher prices. The chances for passing it along appear to be better at present and in the near future than they have been in the past.

Furthermore, social insurance coverage will tend to improve the fundamental economic position of agriculture in at least two respects. First, it will reduce the present competitive disadvantage of agricultural employers in the labor market, and thus help to diminish the shortage of farm labor. When workers in agriculture have social insurance "parity" with workers in industry, they will have less incentive to desert the farm for the factory. Secondly, both agriculture and industry will benefit from the stabilizing effects of a broader social insurance program upon the economy as a whole. The benefits paid to the victims of major economic hazards will provide a bulwark of purchasing power against depression, a backlog of demand for agricultural as well as industrial products.

For the agricultural worker, the relatively unfavorable economic conditions in his field of employment constitute a potent reason for social insurance coverage. Because of low wage rates, intermittent and seasonal employment, and the extent of migration, the agricultural worker is often less able than the industrial wage-earner to provide protection for himself and his family against economic hazards. The following statement appeared recently in a private insurance journal: "Farmers are very much underinsured, and perhaps 50 per cent do not carry life insurance." If half the farmers have no life insurance at all to protect their families in the event of death, how many have annuities to ease their lot in old age? And if the farmers themselves are so poorly protected, what of the sharecroppers and the hired hands?

Extent of Present Participation in Social Insurance

Some agricultural workers are able to gain protection under existing social insurances despite their limited coverage. In two recent studies of seasonal and migratory workers in agriculture,[3] it was found that about four per cent of all the laborers surveyed were protected by the old-age and survivors insurance system. These workers, although employed primarily in agriculture, had earned sufficient wages in covered industry for sufficiently long periods to gain insured status under this program.

This meager percentage, however, does not indicate the extent to which agricultural workers now participate in the insurance program. Of the migratory workers covered by these two sample studies, almost one-half had earned some wages in covered employment during the period 1937–39. Among the local seasonal workers surveyed, about 20 per cent had been in covered employment during the same period. All of these workers had made contributions to the old-age and survivors insurance system. Yet only 11 per cent of the seasonal workers and 15 per cent of the migratory workers who had contributed were eligible for benefits. For the vast majority of contributors, the extent of their participation had not been sufficient for them to gain insured status. Therefore, they have been contributing to a system in which they have thus far acquired no insurance protection.

Furthermore, from the records of their employment in covered

[3] Safier, Quinn, and Fitzgerald. The agricultural wage worker in employment covered by federal old-age and survivors insurance, Social Security Bulletin, July, 1941.

occupations, there was little basis for expecting that many of these workers would subsequently gain insurance protection under the present system. Unless the degree of their participation increases substantially in the future, few of them will ever be able to meet the minimum eligibility requirements for old-age and survivors insurance benefits.

These sample studies necessarily have dealt only with the relatively limited period during which the Federal insurance program has been in operation. They indicate only some of the short-run effects of a social insurance system with limited coverage, in a country where occupational and geographic mobility is as great as it is in the United States. Generalizing from this short run data, it would appear that more than one-sixth of the estimated 4.5 million workers who are annually employed in agriculture have already become subject to some taxation for old-age and survivors insurance since 1936. This proportion will undoubtedly increase with the passage of time, due to normal turnover in the group which engages in covered employment. A considerable increase is likely to result from the expansion of industrial employment brought about by the defense program and the war.

In addition to the short-time movements of agricultural workers to and from covered employment, the effects of long-time occupational changes must be considered. There is the movement of young agricultural workers into industry for a more or less permanent stay, and also the movement of older workers out of industry, into agriculture. Under the old-age and survivors insurance program, every period outside of covered employment reduces the average monthly wage upon which benefit amounts are based. If the time spent outside of covered employment is too great, insured status may even be lost. Thus individuals who spend any considerable part of their working lives in agriculture, even though they are attached to industry for a substantial period, at best will find their old-age and survivors insurance benefits reduced. At worst, they may lose their rights to these benefits altogether. Both the short- and the long-run situation can be remedied only by the extension of social insurance coverage to agricultural employment.

The War and Agricultural Coverage

Under the impetus of the defense program and the war, there has been a sharp upswing in industrial activity. As in the last World

War, there has been a continuous mass migration of farm laborers to industrial defense centers. In addition, many farm workers are engaged in the construction of army camps and in other industrial work now being carried on in rural areas. Furthermore, substantial numbers of rural youth are being trained for defense jobs. Most of these workers are entering covered employment for the first time. Undoubtedly, they will be the very ones to be forced out of employment, if and when a post-emergency depression sets in. A reasonable guess might be that some 2 million of these workers will contribute to old-age and survivors insurance during the emergency, but because of their short stay in covered employment, they probably will not establish rights to benefits.

While the defense program is creating more millions of partially-covered workers, it may also ease some of the administrative problems arising out of the extension of coverage to agricultural workers by temporarily reducing the number of workers in agriculture. The war may be expected to accelerate the trend toward higher wages, restricted turnover, and increased mechanization, accompanied by greater concentration of workers on large-scale farms. Indeed, it is probable that agriculture is about to undergo another great period of mechanization, such as it always experiences in periods of labor scarcity. This will lead to the establishment of many more wage-earner relationships in agriculture. These conditions will simplify the problem of getting wage reports, and give the employees a better chance to satisfy eligibility requirements for benefits. It should also be remembered that the improvement in the economic situation of farmers due to the war will make them better able to pay social insurance contributions.

What Kinds of Protection Can Be Afforded the Agricultural Worker

What types of social insurance coverage should be made available to the agricultural worker? He loses his job, suffers from sickness and accident, becomes permanently disabled, grows old, and finally dies—just like the industrial worker. Economically and socially, the agricultural worker needs every type of social insurance protection which is now, or may be in the future, afforded to the worker in industry or commerce.

The ease with which this necessary protection can be furnished varies somewhat in connection with the type of risk and the nature

of our present arrangements for coverage. The hazards of death and disability probably present fewer problems of special significance for agriculture than the other risks. Old-age coverage differs slightly in that it involves, for self-employed farmers and for some agricultural employees, the special problem of determining when the farmer on the land has retired. On the whole, however, the present system of old-age and survivors insurance can be extended to agricultural employees with relatively few adaptations in the law and its administration. The same is true, in general, for any form of disability insurance which may be added to the Federal system.

For the coverage of agricultural employees, it is probable that only three major modifications in the existing system of old-age and survivors insurance would be essential:

1. Actual extension of coverage;
2. Use of stamp system, preferably on an optional basis, for tax collection and wage reporting; and
3. Some modifications in eligibility requirements, to alleviate the disadvantages resulting from delayed coverage, and to take account of seasonal concentration in agricultural employment.

Other minor adaptations in law and administration would be desirable, but not absolutely necessary.

Protection for agricultural employees against the risk of unemployment involves greater difficulties. Self-employed farmers, of course, are not subject to the risk of unemployment in the usual sense. It might also be necessary to continue the present exclusion of sharecroppers from unemployment compensation coverage because of the special characteristics of their employment. On the other hand, further study may indicate reasonably satisfactory administrative arrangements whereby sharecroppers might be given protection against displacement.

In the case of agricultural wage workers, the difficulties involved in providing protection against unemployment arise less from the character of the risk itself than from the nature of our existing arrangements for dealing with it. With 51 separate unemployment compensation systems, interstate migration of agricultural workers would impair the adequacy of their protection. Moreover, job insurance for agricultural employees would be extremely burdensome unless the present duplication of tax and wage reporting under Federal and State insurance systems is eliminated. Considerable extension of the services now available through public employment

offices, and satisfactory provisions to take account of seasonal employment, would also be necessary. All in all, relatively drastic modifications would be required to fit our present unemployment insurance arrangements to the needs of agricultural workers. Greater specialization to agriculture may be necessary for this risk than for others.

However, these difficulties are by no means insurmountable. This is evidenced not only by our own common sense, but by the experience of other countries. In Great Britain, for example, unemployment insurance was extended to agricultural labor in 1936. Although a separate schedule of contributions and benefits was adopted, the law is administered in conjunction with the law for all industrial workers.

Voluntary Coverage

It is sometimes suggested that instead of adapting our present compulsory insurance methods to the needs of agricultural workers, we should set up a system of voluntary social insurance in which they could participate. However, experience in other countries has shown that state systems of voluntary insurance are "social" insurance in name only. In the first place, if they are not to require huge government subsidies, they must be designed much like private insurance systems to avoid heavy adverse selection. More important, only a small fraction of those who are eligible to participate actually do so—and these participants, by and large, are persons with the least need for social insurance protection. Consequently the value of the voluntary system toward the prevention of dependency is small, and often incommensurate with its cost. The result is that little good is accomplished from the social standpoint.

Conclusion

If the real need of the agricultural worker for protection is to be adequately met, compulsory social insurance is the only practicable method. And it *is* a practicable method, despite the difficulties, real and imaginary, which have delayed its adoption. Santayana has said: "The difficult is that which can be done immediately; the impossible that which takes a little longer." Social insurance coverage for agricultural workers now falls under the heading of the "difficult." It can and should be provided immediately.

HIRED FARM LABOR UNDER MINIMUM WAGE AND MAXIMUM HOURS REGULATION

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MINIMUM wage and maximum hours legislation is based on the theory that the minimum living standards required for health, efficiency and the general well-being of workers can only be maintained in certain instances through the intervention of the state. The objective of such legislation may be merely to prohibit a small number of employers from maintaining lower labor standards than those observed by their competitors located within a narrow geographic radius. On the other hand, such legislation may have for its purpose the raising of the whole level of existing standards in particular occupations to levels which are "fair" in relation to standards in other trades throughout the country.[1] In either instance, however, the fact of regulation presupposes that the workers involved cannot of themselves accomplish this purpose, whether because of race and language barriers, ignorance of prevailing standards, poverty, immobility, an oversupplied labor market, or because of the absence or relative weakness of employee organizations.

If the decision is reached that government intervention is required, it then becomes necessary to consider the nature of the program to be adopted and methods to be used. The methods to be used will depend primarily upon the objectives to be accomplished. It may be decided that encouragement of bargaining between organized groups of employees and employers is all that is required. At the other extreme, wage rates and hours of work might be fixed by direct legislative action. Or, the complexities of the questions involved may suggest the establishment of one or more wage boards to function within certain geographic or industry confines. Or some other method or combination of methods might be devised in light of the particular objectives of the program.[2] Without venturing an answer as to how far-reaching a program may be desirable, it is

[1] For a discussion of the differences in the concepts of a wage rate that is "fair in the narrower sense" and "fair in the wider sense" and also the differences between a "fair wage" and a "living wage," as applied to agricultural labor, see A. C. Pigou, Essays in applied economics, P. S. King & Son, Ltd., London, 1923, pp. 42–49.

[2] See M. R. Benedict and R. L. Adams, Methods of wage determination in agriculture, JOUR. FARM ECON., Vol. XXIII, No. 1, February, 1941.

still possible to consider some of the factors which may affect the feasibility and success of such regulation.

Before considering the prerequisites of successful operation of a program of minimum wage and maximum hours regulation for hired farm labor, however, it may be helpful to review briefly the economic conditions which have given rise in recent years to recommendations in favor of the adoption of such regulation in the United States.[3] Some advocates have based their endorsement entirely on the economic status of hired farm hands, while others have urged that such regulation is desirable from the point of view of the employer and the general public, as well as that of the employee himself.

Conditions Which Have Given Rise to Recommendations for Minimum Wage and Maximum Hours Regulation as Applied to Agricultural Labor

Some inferences as to the relative economic status of agricultural workers may be drawn by comparing their earnings with those of wage earners in other industries and with the income of farm operators. The average annual wage income per worker in all manufacturing industries, following a depression decline, had increased by 1940 to 96 per cent of the 1924–29 average. But the average annual wage income per hired farm worker from agricultural employment (including the value of board, lodging and prerequisites furnished) in 1940 was still at 71 per cent of the same 1924–29 base. Wage rates of farm and factory workers, as distinguished from their annual wage incomes, have shown even more divergent trends.

The marked divergence between the trend in farm wages and in farm income (including government payments) since 1933 may be even more significant. By 1933 total cash farm income and average farm wage rates had both been cut to half of their 1924–29 average. While total cash farm income by 1941 had climbed to approximately 99 per cent of the 1924–29 average, farm wage rates lagged behind each year and in 1941 were only at 83 per cent of the level of the late 1920's. In 1940 the average annual income of hired farm

[3] Testimony which is fairly typical of these recommendations is contained in the record of hearings before the Subcommittee of the Committee on Education and Labor (S. Res. 266, 74th Congress), U. S. Senate, Part 47 and Supplementary Hearings Part I: and hearings before the Select Committee to Investigate the Interstate Migration of Destitute Citizens, House of Representatives, Seventy-Sixth Congress (H. Res. 63, 491, and 629), Part 8.

workers was still at 71.1 per cent of the 1924–29 average, while total cash farm income was at 84.3 per cent, and net income per farm at 91.3 per cent of that level.[4]

Witt Bowden, in analyzing farm labor data, calls attention to the fact that not only have farm wages failed to maintain their relative position with factory wages, but also that hours of labor of hired farm workers have undergone little change since 1909.[5] Several other writers have recorded similar conclusions regarding the hours of work of agricultural laborers, which the limited statistical data available indicate average about 10 hours per day during the year.[6] A recent report on sugar beet workers, who are fairly typical of migratory agricultural laborers, states: "A workday from sunup to sundown, or, as aptly phrased by one worker, 'from kin see to can't see,' has not been uncommon among beet workers, even for the children."[7]

The length of the working day may be considered to be somewhat indicative of agreeable or disagreeable employments. In addition, particularly in those sections of the country where migratory labor is prevalent, living conditions are bad, job tenure is precarious, and annual income is low. Evidence presented before the LaFollette and Tolan Committees by such authorities as Dr. Paul S. Taylor[8] appears to give some weight to Mill's conclusion that the most exhausting and disagreeable employments receive the least pay.[9]

But it is not solely upon the employment conditions themselves that the advocates of extension of minimum wage and maximum hours regulation to agricultural workers depend for their support, but also upon the lack of opportunities these workers have for the betterment of those conditions. The traditional agricultural ladder,

[4] Indices of farm income, farm wage rates, annual income per hired farm worker and per worker in manufacturing industries based on data published by the Bureau of Agricultural Economics, U. S. Department of Agriculture and the Bureau of Labor Statistics of the U. S. Department of Labor. For a more complete discussion of these trends see Witt Bowden, Wages and income of farm workers, Monthly Labor Review, July, 1939, U. S. Department of Labor, Bureau of Labor Statistics.

[5] Ibid., p. 61.

[6] See, for example, J. A. Hopkins, Changing structure of agriculture and its impacts on labor, JOUR. FARM ECON., Vol. XXIII, No. 1, February, 1941, p. 99; and Carl C. Taylor, Helen W. Wheeler, and E. L. Kirkpatrick, Disadvantaged classes in American agriculture, Social Research Report No. VIII, U. S. Department of Agriculture, Washington, D. C., April, 1938, p. 25.

[7] U. S. Department of Labor, Children's Bureau, Welfare of Families of Sugar Beet Laborers, 1939, p. 31.

[8] See footnote 3.

[9] John Stuart Nill, Principles of political economy, Book II, Chapter XIV, Paragraph 1.

from hired hand to tenant to farm owner, has not worked sufficiently well, particularly during recent years when there has been an over-supply of agricultural labor in relation to demand,[10] to provide ready opportunities for self betterment to the average hired farm worker. The lack of opportunity of agricultural laborers is not dependent solely on their inability to become tenants or farm owners. They are employed in relative isolation and may be required to move from job to job so that there is little opportunity for them to organize for the purpose of bargaining with their employers or even to discuss their problems with fellow employees.

Recommendations for legislation of this type, however, are not based solely on the economic status and lack of opportunities of the farm employee group. Farm operators have long been concerned with the problem of maintaining an adequate and reasonably stable supply of labor. It is of timely interest to note that minimum wage legislation for agricultural workers was first adopted in England in 1917 and that one of the main reasons advanced for this legislation was that it would keep laborers on the farms and so make possible greater production of food for war-time needs.[11] At a time such as the present, when workers are being drawn from the farms, a cry arises from rural communities that they cannot obtain sufficient laborers to cultivate and harvest their crops.[12] As early as 1938 the International Labour Office reported that in some countries a shortage of agricultural workers had been observed and that the need to "encourage them to remain on the land" was acute.[13] It has been urged by proponents of agricultural wage and hour regulation in this country that if certain basic labor standards were required there would be more incentive than at present for workers to stay on the farms.

The farm operator, even more than the industrial employer, is

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[10] John Hopkins (op. cit., p. 100), writing at the beginning of 1941, pointed out that technological progress plus a slowing down of farm to city migration had swelled an already overabundant supply of farm labor.

[11] George Dallas, M.P., Farm wages and wage regulation in England and Wales, Proceedings of the International Conference of Agricultural Economists, Second Conference, 1930, p. 442. Further raising of minimum wages has been one of the government means of protecting the supply of agricultural labor in England during the present war. (Frieda Wunderlich, British labor and the war, p. 49.)

[12] The Christian Science Monitor, on November 4 and 5, 1941, reported shortages of agricultural labor in both Oregon and New York. Soldiers, students, women, and children were requested to go into the fields and help harvest crops.

[13] Social problems in agriculture, Record of the Permanent Agricultural Committee of the I. L. O., Series K (Agriculture) No. 14, Geneva, February, 1938, p. 19.

concerned with preventing labor unrest because of the very serious economic loss that might result from an agricultural workers' strike. In this connection it is significant to note that strikes and civil strife in agriculture, often marked by serious violence, occurred with greatest frequency during the rapid fall in farm wage rates at the onset of the depression in 1929–30. In the 1927–29 period only one to four strikes, involving a total of from 100 to 410 agricultural workers, occurred per year. In 1931 the number of agricultural strikes increased to 10, involving a total of 14,000 workers, and in 1933 to nearly five times as many involving a total of 59,000 workers.[14] Just as in enacting the Fair Labor Standards Act of 1938 the Congress found that,

> the existence . . . of labor conditions detrimental to the maintenance of the minimum standard of living necessary for health, efficiency, and general well-being of workers . . . leads to labor disputes burdening and obstructing commerce and the free flow of goods in commerce,[15]

so also may low wages and long hours of work in agriculture lead to labor disputes and strikes.

The effect on the small farmer of the low wages and long hours of the hired workers of his larger competitors is in itself an important factor adduced in support of wage-hour legislation for agricultural workers. In the first place, as pointed out in a report of the International Labour Office,[16] it is not uncommon for wage-paid labor and small farm operators to compete with one another on the agricultural employment market.[17] Secondly, the products produced by small farm operators and the members of their families compete on a national market with products from farms employing workers for long hours and at low wages, and this tends to keep their living standards correspondingly low.

One reason often cited in favor of minimum wage and maximum hours standards for agricultural workers is that farm operators in recent years have received government aid in obtaining a more satisfactory income. It has been argued, therefore, that it is both feasible and fair that some part of these benefits be extended to their employees. As the tendency for farmers to receive govern-

[14] U. S. Department of Agriculture, Report of the Secretary of Agriculture, 1937, p. 39.

[15] Fair Labor Standards Act of 1938, Finding and Declaration of Policy, Section 2(a).

[16] Social problems in agriculture, op. cit., p. 91.

[17] The 1940 U. S. Census of Agriculture reports that 8.2 per cent of all farm operators found part time employment on other farms.

mental assistance has strengthened in recent years, the feeling has grown that agricultural labor should obtain some share in the benefits of these programs. In the case of the Sugar Act of 1937, for example, the benefit payments to sugar beet and sugar cane producers is made conditional upon the observance of certain labor standards.[18]

The general public also has an interest in raising the standard of living of hired farm laborers. Though different, this interest is as great as that of farm workers or farm operators. The interdependence of the agricultural and industrial parts of the economy has been so thoroughly documented during the past decade as to require no further elaboration here. To the extent that an important part of the farm population lacks an adequate income, this necessarily affects adversely the industrial economy.

Perhaps more important, however, farm operators, and also the general public as consumers of farm products, are interested in the efficiency with which agricultural commodities are produced. An improved standard of living for agricultural wage earners should increase the efficiency of farm operations in several ways. First, it may be expected that because higher wage rates, shorter hours, and better working conditions in industry have been accompanied by greater productivity of labor, the same tendency may be expected in agriculture.[19] Improved working conditions may also be expected to reduce the exodus of trained farm workers to other occupations and thus raise the general efficiency of the farm labor force. Further, to the extent that it has been possible for some operators to produce products on sub-marginal lands by the payment of low wages or long hours of work these operators may be forced off poor land. Other farmers of course, may be encouraged to increase the mechanization of their operations.

All of these factors making for greater efficiency of agricultural production may be followed sooner or later by a decline in farm employment if the demand for farm products as a whole is inelastic.[20] As an offsetting factor, however, it should be noted that

[18] A subcommittee of the Senate Committee on Education and Labor, headed by Senator Pepper, has recently been holding hearings on a bill, S. 1435, which would extend the principle of the Sugar Act to other agricultural commodities.

[19] John R. Commons and John B. Andrews, Principles of labor legislation, Harper & Brothers, New York, 1920 Edition, p. 215.

[20] Pigou (op. cit., pp. 50, 51) argues that employment might be slightly increased because of a legally imposed minimum wage, but he apparently overlooked some factors making for reduced employment.

one of the reasons customarily advanced for maximum hours legislation is that shorter hours of work will increase employment. It is assumed that it is more desirable to have some workers regularly employed throughout most of the year than to have a larger number employed for shorter periods.

Feasibility of Regulation

The social and economic conditions responsible for sentiment in favor of regulation of wages and hours of work of agricultural laborers thus provide forceful arguments for such regulation. Some critics have argued, however, that less need exists for wage and hour regulation in the field of agriculture than in other industries. A study of the National Industrial Conference Board, for example, states:

> The essentially non-competitive character of agricultural enterprises has served for the most part, to protect the workers from those undesirable conditions resulting from unfair competition between employers, and has, as a result, caused regulation to seem less imperative in this field.[21]

It is also contended that long hours of work in agricultural employments do not endanger health, even of women and children.[22]

However, objections to legislation of the type being considered here are more often based on questions as to its economic and administrative practicability rather than on arguments concerning the need for minimum standards. In general these objections are those which traditionally have been raised against any proposals to regulate labor standards through state intervention—whatever the industry. One argument, however, has been more forcibly presented against the regulation of working conditions of agricultural employees than in the case of industrial employees. This is the contention that the economic status of the employing group is so precarious that any increase in wage costs would produce certain ruin for large numbers of farmers.

This argument is based on several assumptions. First, it assumes that wage increases resulting from minimum wages or requirements for overtime pay would not be offset by increased labor productivity. It further assumes that no part of the increased cost can be passed on to consumers, processors, or distributors. Finally, this

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[21] The work of the International Labor Organization, National Industrial Conference Board, Inc., New York, N. Y., 1928, p. 110.

[22] Commons and Andrews, op. cit., p. 234.

argument does not take into consideration the possibility that whatever type of legislation might be adopted could have sufficient flexibility to avoid unreasonable cost increases to farmers.

The extent to which the added cost effect of minimum wage requirements might be offset by greater productivity per wage earner cannot be measured precisely. It will depend on the type and scope of the program to be adopted as well as on such other factors as the present extent and future possibilities of mechanization, the available supply of labor and the degree to which the workers' efficiency can be improved under incentives. Numerous studies have been made in recent years which indicate that further technical improvements in farming methods, which have already been responsible for a considerable increase in the productivity of farm workers, may be expected.[23] It is taken for granted by most writers that better nourishment of workers made possible by higher standards, the spontaneous response of workers to improved rates of remuneration, and the threat of unemployment if they do not "measure up" under conditions of higher wages and regulated hours, will cause workers to be more productive.[24] It is also to be noted that minimum wage and maximum hours regulation tends to make management more efficient, both with respect to the hiring and training of employees and also in connection with the planning of their work and their supervision.[25] It may be expected that the combination of these factors, as affected by shorter hours of work accompanied by overtime pay and minimum wage requirements, will result in increased labor productivity.

It is even more difficult to determine the extent to which higher net costs, if any, resulting from increased wage rates or shorter working hours may have to be absorbed by producers rather than passed on to consumers, processors, or distributors. This will depend on such factors as the elasticity of demand for the particular product or products, the extent to which total production costs may be increased, prevailing supply and demand conditions, and the

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[23] See, for example, Technology on the farm, Bureau of Agricultural Economics, U. S. Department of Agriculture, August, 1940; and John A. Hopkins, Studies of changing techniques and employment in agriculture, Works Progress Administration, National Research Project.

[24] See Pigou (op. cit., p. 57) and also Commons and Andrews (op. cit., p. 216).

[25] The inefficiencies of management in the "farming industry [which has] been built up with an almost criminal disregard of human effort" is a theme which runs throughout Labor in agriculture by Louise E. Howard, published in 1935 by the Oxford University Press. See particularly p. 112 and pp. 222–249.

relative bargaining position of producers, middlemen, and consumers.[26] While it may be expected that there would be some shifting of consumers' purchases from one product to another, the extent of such shifts would be sharply limited by the extent of increased cost resulting from the program. In actual practice, consumers' prices would be most affected in the case of staples or relatively indispensable products, especially where such products are produced in a low-wage area and under conditions of a relatively high ratio of labor to total costs. Farmers' costs, would be affected most in situations where a large proportion of their labor is performed by hired hands at low wages, in the production of "semi-luxury" products for which consumers might have many possible substitutes.

The complexity of conditions affecting farmers' net returns is such that no single answer can be given as to whether farm operators would directly benefit, suffer from, or remain unaffected by wage and hour regulation. The program adopted might affect adversely some large farm operators whose ability to compete depends on sub-standard working conditions. However, there appears to be at least an even chance that the benefits to family-sized farms from such a program would more than offset any disadvantages to the larger employers of hired labor.

It has already been indicated that, to the extent to which minimum wage and maximum hours legislation would result in the displacement of some workers, it would not be an unalloyed blessing. Certainly, it may be expected that some less efficient workers, or workers on marginal farms, might lose their employment on farms. In the long run, the disadvantages of a smaller number of wage workers finding employment in agriculture must be weighed against the advantages of more efficient and humane employment conditions.

One further reason consistently advanced in opposition to wage and hour regulation for agricultural workers is the administrative difficulty involved in regulating working conditions on hundreds of thousands of widely scattered farms, producing different crops, and operating under a wide variety of physical and economic conditions. Such objections appear to carry particular weight in connection with the possible regulation of hours of work, since labor require-

[26] For a discussion of some of these factors see the testimony of Arthur M. Ross before the Select Committee to Investigate the Interstate Migration of Destitute Citizens, House of Representatives (op. cit., pp. 3452–3453).

ments are profoundly affected by unforeseeable climatic conditions. It is argued that the wind, sun, and rain cannot be governed by man-made laws, nor can dairy cows and chickens be instructed as to the time and quantity of production. Nevertheless, it is of interest to note that maximum hours regulation for agricultural workers has proceeded successfully in many foreign countries.[27] The extent of the administrative problem will depend almost entirely on the nature and scope of the program adopted. Therefore discussion of this problem must be dependent upon some analysis of the structure of the working agricultural population.

Census of Agriculture figures for 1935 furnish some clue as to the size of the different segments of the working agricultural population.[28] That census reported almost one million farms employing one or more hired laborers as of January 1, 1935. This group of farmers may be considered to comprise the "upper class" of the agricultural community. However, this group may be further broken down to indicate their relative status as employers into those which have only one or two hired hands, those which have 3 to 9 employees, and the small number at the very top, those with 10 or more hired workers. Nearly three-fourths of the million farmers having hired workers had only one hired hand, and nearly 90 per cent had one or two. This leaves slightly more than 10 per cent, the "real aristocracy" of the employing farmers, with three or more workers, and of these only a little more than one per cent, or 11,410 farms, had 10 or more hired laborers. In terms of the grand total of all farms enumerated by the census, approximately 14 per cent had some hired workers, but only about 1.6 per cent had three or more employees and less than two-tenths of one per cent had 10 or more.[29]

On the next rung down the agricultural ladder are those farmers who employ no hired help. It is this group and the working mem-

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[27] For a summary of maximum hours regulation as applied to agricultural workers in foreign countries see Social problems in agriculture (op. cit., pp. 21–37).

[28] Detailed breakdowns of figures from the 1940 Census are not available as this is being written, but it is expected that they will show a similar pattern.

[29] All figures are used as of the Census enumeration date, January, 1935. Considerable differences would be indicated if data for the peak harvesting season were available. For instance, it has been estimated by Julius T. Wendzel (Monthly Labor Review, September, 1937, U. S. Department of Labor), that the number of farms reporting hired labor would have increased from 967,594 in January to 1,482,697 in July. However, the percentage distribution of workers on these farms in July is substantially similar to the January percentage distribution.

bers of their families which make up the great bulk of the agricultural population. The Census shows that there were more than 5 million farms, not including those operated by sharecroppers, or approximately 75 per cent of the total, for which no hired help was reported in January, 1935. The farmers operating these farms together with other working members of their families accounted for well over 8 million persons or more than 65 per cent of the total employed in agriculture.

The number of farms operated by sharecroppers was reported by the Census as a little more than 700,000 in January, 1935, and these farms employed nearly a million and a half persons, practically all of whom were classed as unpaid family labor. Sharecroppers and share tenants are difficult to classify with respect to their employment conditions. They include some who approximate the farm-operator status as is suggested by the fact that thousands of sharecroppers are in a position to employ their own hired hands. On the other hand, croppers and share tenants include individuals at the very bottom of the income level of agricultural laborers.[30] In developing a program for the betterment of the standard of living of agricultural workers it would be wrong to neglect consideration of the effect of such a program on these workers.

The hired labor on farms which reported only one or two workers, totaling approximately a million workers in January, 1935, also may be considered as a special group of employees. Vice-President Wallace, as Secretary of Agriculture, and also Secretary of Labor Perkins, in discussing the possibility of applying minimum wage and maximum hours legislation to agricultural workers, have indicated that a distinction should be made between farms employing only one or two workers and those employing a relatively large number of hands. It is argued that the typical hired hand on small family farms is apt to be comparable to a member of the family having "a 'moral claim' to participate in his employer's ups and downs."[31] It is also argued that when only one or two workers are

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[30] For a discussion of the labor status of share tenants and sharecroppers, see Commons and Andrews, op. cit., p. 63. While the Census classifies sharecroppers of all kinds as farm operators rather than hired hands, such a classification is subject to some question. See also, Trends in employment in agriculture, 1909–1936, Works Progress Administration, National Research Project, November, 1938, p. 6; and Fallacious census terminology and its consequences in agriculture, Social Research, 5, No. 1 (February, 1938) pp. 19–36.

[31] Statement of Secretary of Labor before a Subcommittee of the Senate Committee on Education and Labor, May 6, 1940.

employed "no questions are likely to arise which cannot be settled equitably by the persons concerned."[32]

If the suggestions of these authorities were to be followed, legislation for direct state intervention in determining minimum wages and maximum hours would be limited in coverage to that relatively small number of farms where three or more workers are employed. As was shown above, such farms included only 107,000 or 1.6 per cent of the total number of farms as of January, 1935. It has been estimated, however, that as of July, 1935 this number would have increased to more than 183,000, or to 2.7 per cent of the total number of farms. While in January such farms employed less than 650,000 workers, it was estimated that as of July they employed approximately 1,156,000 workers or more than 43 per cent of the total number of hired farm laborers in the United States.[33] Hence, it is seen that it would be possible to limit coverage the legislation to a relatively small number of farm units, thus reducing materially administrative difficulties, but still dealing with the problems of a substantial proportion of the total number of hired farm laborers.

Limiting the coverage of wage and hour regulation to particular employers, while it may solve some problems will, of course, raise others. The question of competitive discrimination between "covered" and non-covered workers is important. It might be observed in passing that the competitive difficulties of covered farmers would be in direct proportion to the number and importance of non-covered farmers—the smaller the proportion of farmers exempt from coverage the smaller would be resulting competitive disadvantages.

Even with only a relatively small number of farm employers covered many perplexing problems of administration will arise. The nature of these problems and the extent to which they might nullify possible beneficial effects would depend to a very considerable extent on the type of program adopted. For this reason it appears desirable to consider in as much detail as time permits some of the factors which will affect the success or failure of this type of regulation.

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[32] Letter of the Secretary of Agriculture on S. 2008 to Senator Thomas, Chairman, Senate Committee on Education and Labor, May 11, 1939.

[33] July estimates were made by Julius T. Wendzel (op. cit.).

Factors Which Will Affect Success or Failure of Regulation

The greater the degree to which wages and hours established by law differ from those which would obtain through the operation of economic processes, the greater the inducement to violate the law. In legislation of this type it has therefore been generally recognized that changes to be produced by regulation should not be too abrupt and should take into consideration local conditions and problems of competing producers. This is another way of saying that the success or failure of the program will depend to a large extent on the flexibility of the standards adopted.[34]

It should be recognized at the outset, then, that minimum wages if established could not be uniformly applied to all types of work for all agricultural commodities. The minimum rate established for employees operating cotton picking machinery in Texas might not be the same as that of cotton pickers in Mississippi, nor should the wage rate of operators of mechanical cotton pickers necessarily be the same as that of wheat combine operators in Kansas. Minimum wage levels established should take into consideration existing wage rates for the particular type of work in the particular section and in competing areas. They might also take into consideration such factors as the available supply of labor, opportunities for alternative employment, and the ability of farmers to bear increased costs as measured by farm prices and income derived from particular crops. But consideration of these factors alone is not sufficient.

The minimum rate adopted would have to make allowance for the amount and value of perquisites furnished by the employers. The Fair Labor Standards Act provides[35] that the " 'wage' paid to any employee includes the reasonable cost, as determined by the Administrator, to the employer of furnishing such employee with board, lodging, or other facilities, if such board, lodging, or other facilities are customarily furnished by such employer to his employees." The practice of furnishing facilities to employees is more prevalent in agriculture than in industry. In agriculture the value of such perquisites constitutes a significant part of the total value of the workers' compensation mainly in the case of the more permanent farm laborers who are resident on the farms and hired by the month, as contrasted with migratory farm workers, piece

[34] It should also be recognized, as the experience of the NRA appears to indicate, that too much flexibility might neutralize the effectiveness of the regulation.
[35] Section 3(m).

workers, and most day workers.[36] Minimum wage regulation for agricultural workers of course, would raise the problem of placing a reasonable evaluation of perquisites actually furnished covered workers. This problem can be a very troublesome one, and effective administration may necessitate limiting the inclusion of perquisites as part of the minimum wages to those situations in which they are a substantial and customary part of the wage bargain, and the facilities or commodities furnished have an easily determinable cost or market value; or it may require a fairly arbitrary evaluation of perquisites.

A particularly difficult problem in connection with the administration of wage and hour legislation for agricultural workers might arise because of attempts to circumvent regulation by the device of setting up "independent contractors" or "partnership" arrangements. Thus, hired workers might become sharecroppers or share tenants for the purpose of evading wage and hour regulation. Some consideration would have to be given to methods of preventing such evasion if an effective program is to be obtained.

Another problem which may require attention is piece rates as compared to hourly or weekly wage rates. While the Fair Labor Standards Act is written entirely in terms of minimum hourly wages, it has often been suggested that the minima, in certain situations, should be based on the average earning power of all employees, including both slow and efficient workers. It is argued that if a uniform minimum hourly rate is required for all employees the result is apt to penalize the fastest and most efficient workers. Without analyzing the validity of these arguments, it may be said that the method of handling piece-rate wages as compared to hourly or daily rates must be thoroughly considered, as must also the question of whether particular exemptions should be provided for learners and for handicapped workers.

Because of the complexity of the problems involved in the establishment of minimum wages in agriculture, it would be difficult to prescribe in specific statutory language the actual rates and conditions of payment. It is therefore suggested by some authorities that wage-rates should be determined by a central board or committee

[36] The United States Department of Agriculture's wage data show an average differential between monthly farm wage rates with and without board, lodging and other perquisites of $8.00, or a monthly cash wage that is approximately 31 per cent greater than the wage with perquisites, during the period 1935–1939.

acting on the advice of local boards or committees.[37] Experience with this type of legislation in foreign countries, particularly England, has been cited in support of this idea.[38] It is maintained that in this way not only would it be possible to have representation of both employers and employees, but it would also permit ample consideration being given to local conditions and the broader problems of competition between regions.

Hours legislation, at least in the United States, is generally thought of only in terms of limitations on daily or weekly hours of work. Little attention has been given to possible legal requirements for holidays with pay and other indirect ways of reducing working hours,[39] although in many foreign countries this has been the principal type of regulation adopted.[40] The indirect method of regulating hours of work may guarantee daily or nightly minimum rest periods. It may also require the observance of legal holidays and week-end rest periods. Legislation in some countries has also included requirements for annual holidays with pay. The Draft Convention adopted by the International Labour Conference in 1936 stated, in connection with legislation for agricultural workers, "that the worker should be entitled after one year of continuous service to an annual holiday with pay."[41] Regulation, therefore, may be either direct or indirect, and it may deal with daily, weekly, or annual rest periods.

The success of efforts to regulate the hours of work of agricultural laborers will depend to a considerable extent on whether the length of the workday, workweek, or season is due to natural causes or to factors controlable by man. The length of the natural day and also the length of the growing season vary with the latitude.[42] As one approaches the poles the growing season becomes shorter and the natural day during the growing season longer, which means that work in connection with the raising of crops must necessarily be crowded into a shorter period of the year.[43]

[37] See, for example, Benedict and Adams (op. cit., pp. 80, 83, and 84).

[38] See Frieda Wunderlich (op. cit., p. 49).

[39] For a discussion of the advantages of indirect limitation of hours of work in agriculture as compared to direct limitation see International Labour Review, International Labour Office, Vol. XXV, No. 1, January, 1932, pp. 81 and 82.

[40] Social Problems in Agriculture (op. cit., pp. 39–54).

[41] Ibid., p. 43.

[42] The length of the growing season may also, of course, be affected by such factors as the proximity of the Gulf Stream. Thus, for example, the length of the growing season in some parts of Florida may be nearly equal to that at the equator.

[43] At the equator the length of the day during all months is approximately 12

This indicates that allowance may have to be made in northern states for a longer working day than in the South which could be offset from the employees' viewpoint, by a longer winter vacation.

Other natural factors affecting the length of the workday are the stability or instability of weather conditions and to some extent the type of farming. Unstable weather conditions often oblige a farmer to be idle for a while and then carry out his work within a shorter period of time than originally planned. Animal husbandry probably has less irregularity due to natural causes than cultivation of the soil, being characterized by a regular amount of work although often distributed over most of the twenty-four hours of the day. A one-crop agricultural system is marked by a spring and fall labor peak when much work must be crowded into a short time. In diversified farming the amount of work to be done may be increased, but seasonal variations are apt to be smoothed out. In addition to natural factors affecting the length of the inactive periods of agricultural workers, there are other conditions which have tended to reduce these periods to a minimum. It is in connection with the possibility of mitigating the influence of these conditions which are not due to natural factors that maximum hours legislation is principally concerned.

Casual laborers and migratory workers make up a large though unknown proportion of all agricultural workers.[44] The length of rest periods available to such workers, except periods of forced idleness when they are unable to obtain any employment, is sharply limited by their need to squeeze as much work as possible into a short period so that they will have the means of existence during the "dead season." To the extent that shorter working hours, both daily and weekly, would spread employment over a longer period of time, maximum hours legislation would tend to regularize agricultural employment. Guarantees of holidays with pay would have a similar tendency.

The length of the work period required in agriculture also depends on the supply of labor available to do that work. When real shortages exist as distinguished from shortages due to the unwill-

hours. At 30° latitude, in northern Florida, the day during July will be less than 14 hours long and during January more than 11 hours long. On the other hand at 48° latitude, in North Dakota, the day will be approximately 16 hours long during July while it will be just about half that in January.

[44] For a summarized description of the status and social significance of casual-migratory workers, see Carroll R. Daugherty, Labor problems in American industry, 1938 Edition, pp. 263–266.

ingness of particular employers to maintain "fair" labor standards, it may be necessary to increase hours of work.

The technical organization and equipment of the farm, including the size of the farming unit and the extent of mechanization, will also help to determine the number of hours of work that may be required. Similarly, the type of farm, as affected by choice of crops, combination of enterprises, and diversification affect materially the working hours. Hours of work in agriculture are sometimes needlessly expanded because of lack of proper equipment, the lay-out of the farm, and the planning of work.[45]

It is expected then that maximum hours of work would be established by governmental intervention only after adequate consideration had been given to both the natural and the controllable factors affecting labor requirements in particular areas. Most countries in recent years have adopted laws regulating hours of work in agriculture which have allowed farmers considerable latitude to exceed the maximum prescribed when it has seemed necessary. Earlier attempts at hours regulation for agricultural labor were often stringent and therefore short-lived, but later regulation which has been more flexible has also been more successful.

Some of the means for providing flexibility which have been adopted in foreign countries are: (a) setting no absolute maximum on hours, but requiring penalty rates for all hours worked beyond a specified number; (b) permitting any number of hours to be worked during seasonal peaks and requiring the payment of a bonus upon the completion of the rush work; (c) setting a monthly or weekly instead of a daily maximum: (d) varying, in the regulations, the maximum hours with the season, thus having a higher maximum for summer than for winter, etc.; and (e) providing for exemption from the requirements during emergency periods. In any instance the desired objective would be to obtain the maximum amount of flexibility consistent with the purposes to be accomplished. Here again it may only be possible to achieve needed flexibility by the establishment of local boards or committees.

Other factors, in addition to the flexibility of the program to be adopted, will affect the success or failure of wage and hour regulation in agriculture. Pigou contends that to the extent that wages are kept down by monopolistic practices of employers—by "custom, inertia and tacit combination"—the enforcement of minimum wage rates would not only increase the wages of individual em-

[45] See Louise E. Howard (op. cit., pp. 112, 118 and 119).

ployees, but would result in increased agricultural production and employment, to the benefit of the entire community. On the other hand, he says that if attempts are made to increase wage payments which are low because of an excessive labor supply "minimum wage legislation will be the reverse of desirable." He concludes, therefore, that "the establishment of Wages Boards instructed to combat 'unfair' wages in several agricultural districts is likely to lead to good or bad results, according to the manner in which these Boards interpret their functions."[46] It follows too that success or failure will depend at least partially on the manner in which the agency established to administer the law carries out its function. The heterogeneous nature of the agricultural enterprise—the wide variations in products produced, climatic conditions, efficiency of labor supply, types and size of operations, mechanical equipment used, and customs—would place a large measure of responsibility on the administrative agency for a just and effective regulation of working conditions. It may be assumed that the attitude of workers, farmers, and the public toward agricultural wage and hour regulation will play some part in determining the success or failure of such a venture.

The purposes of minimum wage and maximum hours regulation as applied to hired farm labor appear to be consistent with the public welfare and the feasibility of such a program demonstrated in part at least by the fact of its operation in a number of foreign countries. However, both the feasiblity and the success of such regulation are unpredictable except in terms of methods to be adopted and administration employed.

DISCUSSION BY W. G. MURRAY

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Although I agree in the main with Mr. Corson's appeal for social insurance for farmers, I wonder if he has not paid too little attention to farm labor conditions. It is possible that Administrative difficulties are not the fundamental reason for opposition to social insurance for farm workers. To begin with, there are more farm operators than there are hired laborers on farms. According to Mr. Corson's figures the operators number 6 million, and the hired workers of all kinds, including share croppers, number only 4½ million. A vote on any issue that divided operators and hired workers would give a distinct advantage to the operators. Moreover hired hands that are sons of farm operators would not have the strong hired labor attitude characteristic of industrial labor. Finally, agricultural labor-

[46] Pigou, op. cit., pp. 51–52.

ers who work only a few weeks in the year in harvesting operations are likely to have only a slight interest in improving their working conditions. What this all adds up to is that there is a distinct difference between industrial and agricultural labor conditions. It is not merely a difference in degree but a difference in kind.

To meet the social insurance needs of agriculture, a comprehensive program should be arranged that would cover all people engaged in agriculture. Mr. Corson has suggested such a program but has not elaborated on it. Such a program should attract the owner operator and tenant as well as the hired laborer. Furthermore, it should be integrated closely with the program of the Farm Security Administration which is providing security of income for low-income farmers. In addition, such a program should be coordinated with the Agricultural Adjustment Administration, The Civilian Conservation Corps and other agricultural agencies which like the Farm Security Administration have been contributing to farm security by stabilizing farm income and employment.

If we judge the merits of a proposal by the enthusiasm of the author, wage and hour regulations for farm labor do not have much in their favor according to the general tenor of Mr. Warren's paper. But this is not a fair criterion. Although Mr. Warren has taken particular pains to point out the difficulties of wage and hour regulations for agriculture, his statement of the situation adequately supports his conclusion that the purpose of such a program is consistent with the public interest.

A striking fact brought out by Mr. Warren is the unusually small number of farm operators who would be affected if wage and hour regulations were restricted to farmers employing more than 3 workers. Only 1.6 per cent of the farms would be affected if the Census statistics as of January were taken, and not more than 2.7 per cent if July estimates were used.

The rapid expansion in wage and hour provisions for industrial workers makes it desirable for agriculture to give serious thought to improvement in the conditions under which laborers work on farms. Such improvements should deal not only with wages and hours but with social insurance and safety as well.

In his closing sentence, Mr. Warren states that the feasibility and success of wage and hour regulations are in part unpredictable. If so, the present war emergency may well be an appropriate time to establish temporary wage and hour regulations. Such a move could not be opposed on the ground that it would cause unemployment among farm workers. In order to introduce the regulations without disturbance, they could be restricted to certain areas or types of farming, and to farmers employing more than a fixed number of employees. Agricultural leaders, if they are sufficiently far-sighted, can do agriculture a fine service by assisting in the development of wage and hour provisions suited to farm conditions. We should not forget that hired labor on a farm is entitled to conditions which approximate those of the workers in the industrial plant. It will probably always be difficult to make direct comparisons of agricultural and industrial well-being, but attempts to achieve some measures of equality most certainly should be undertaken.

IMPORTANT CONSIDERATIONS IN DETERMINING A FAIR PRICE FOR FLUID MILK

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CONSIDERATION should be given to the problem of what constitutes a "fair price"[1] for milk, before attempting to compute it. What are the objectives or aims toward which the establishment of a "fair price" is directed? These are matters that should receive attention before any price computations are undertaken.

Among possible aims or objectives, and the price systems and price levels to which they give rise, are the following:

(1) A concept of parity price or parity income. While these terms are familiar to all, their interpretation varies and attention, therefore, must be given to the definition of the parity concept when applying it to milk prices.

(2) A price that equates the supply of, and demand for, fluid milk, and "clears the market."

(3) A price that returns monopoly gains on milk or cream to producers. By adjusting prices in different parts of the market or for different forms of the product, or both, it may be possible to secure a greater total return than would otherwise be realized.

(4) A price that maintains the industry in its present size or condition.

(5) A price that attempts to follow short time movements in production or distribution costs.

There are many other objectives than these mentioned, but they serve to demonstrate the need for deciding upon the objectives of "fair prices" before attempting to determine the prices themselves. Unless these objectives have been first agreed upon, much of the activity of assembling statistics, preparing briefs, testifying at hearings, and analyzing data, is so much wasted effort.

If stability in milk markets is ever to be attained, much more attention must be paid to the general level of milk prices than is

[1] Throughout this paper, the terms "price" and "fair price" are used to refer to the whole system of prices and price spreads existing in the market. Changes in the level of milk prices and in the relationship of one to another are referred to only in general terms. This does not imply that specific data regarding particular markets, price-making forces in those markets, and relationships necessary to the determination of "fair prices" in those markets are of less importance than those matters discussed in this paper. Limitation of time is responsible for the choice made.

now the case, where decisions appear to be based much more on changes in day to day and month to month costs and returns, than on any more far-sighted criteria. This does not mean that milk prices should be fixed over long periods of time or that exceptional conditions, seasonal market changes, and other unusual developments should not be adjusted for. Obviously, any workable price system needs flexibility and needs it promptly in order to take care of unforeseen and unpredictable conditions in the market, but dairying is a long time business and the decisions of producers, consumers, and distributors are not based on day to day and month to month price changes.

Having agreed upon what constitutes a "fair price," how can this price be determined? Whatever the objectives chosen, the following considerations must be taken into account in determining a proper milk price level at any particular time and place: (1) The level of prices which will maintain, or decrease, or increase, production in the milkshed; and (2) the level of prices which will maintain, or decrease, or increase, consumption in the market.

These two sets of factors (and the price spreads existing in the market) must be considered together. In the heat of discussion the importance of considering both these "blades of the scissors" is often forgotten, and suggestions are made on the basis of production costs alone or demand conditions alone and not on the basis of both considered together.

A discusssion of the specific data needed in order to determine those prices in a particular market which will be in harmony with the objective, is beyond the scope of this paper. But it is desirable to point out some of the important types of information needed before a "fair price" can be determined.

Both short-time and long-time responses of different groups of producers and different income groups of consumers to changes in price are important. The long-time responses are far more important from the standpoint of the general welfare of all concerned than are the short-time effects. For example, a change in consumers' budgets which may not occur until a year or so after a change in the level of milk prices may be of much more importance to the industry and to the nation than the response which takes place the day after, or the week after, or the month after, a change in resale prices. Similarly, while the short-time response of producers in an area to a change in prices may be important from the standpoint of

the plant operator, the grain merchant, and the immediate income of the producer, this immediate response to a price change is far less important than the response of producers to a price maintained at a changed level for a long time. In the latter case, farms may be abandoned and cows sold, or farms may be bought and young stock raised, and the whole agricultural picture of an area may be changed in response to the new level of milk prices.

In this connection, great caution should be used in establishing prices on the basis of short-time production costs, which by their very nature must be arbitrary. For example, while more money may need to be paid out in the winter months for purchased feed than in the summer months when cows are on pasture, this does not warrant setting monthly prices on the basis of calculated production costs in any particular month as though the production process could be completed entirely within that month. To do so is somewhat as if an automobile company attempted to compute its costs and base its price policies upon a month's operations during either the "model change over period," or during the period of heaviest production.

At present, many of the data necessary to determine proper price levels for milk are not available or are only suspected. We have little information which means anything on the response of consumers to price changes. What we do have refers largely to short-time responses; and within the price ranges observed in most of the studies, these responses have been found to be small and perhaps, rightly, have been considered of little importance.

We are only beginning to investigate the shape and the level of the demand curve for milk among groups of people of low incomes and in price ranges outside of those considered normal. We know practically nothing about the response which consumers make after a price level has been in force for months or even years. These latter responses are probably of great and fundamental importance to the milk industry and particularly to the fluid milk industry. There is reason to believe that through custom and lack of knowledge of the qualities of competing products, consumers are slow to change their food habits. But given a price relationship which has been maintained over a period of time, a response is likely to be forthcoming which, though gradual, may have far-reaching effects. For example, price relationships between fresh and evaporated milk have been such in recent years that an equivalent amount of

whole milk could be purchased in evaporated form much cheaper than in fluid form. No immediate response to the differential between the prices of these two products has been observed; nevertheless, there has been a steady and, cumulatively, large increase in the per capita consumption of the evaporated product, while that of fluid milk has changed only slightly. This response would seem to be one of those long time responses which are apparently given little consideration in price determination but which are, fundamentally, of far more importance than the small fluctuations which may accompany a resale price change and which may, after a few weeks, practically vanish.

Even the determination of the objectives and of the price levels to attain them is not enough. Unless this determination is translated into action and unless this action is taken by those influential in determining prices in a market, it will be of little value. Unfortunately in practice this latter step has seldom been taken and instead of attempting to adhere to a policy that will maintain such a price level, those influential in price making have often acted as pressure groups who paid no attention to these more important aspects. Too much of the evidence collected has been prepared to support the real or fancied interest of a particular group or organization and the interests of the market as a whole have been ignored. The result is a price or system of prices which only by accident coincides with that which enlightened action would bring about.

To recapitulate: the thesis of this paper is that first and most important in arriving at a "fair price" for milk is to determine what accomplishments are wanted from the price policy, i.e., what objectives are to be reached? After that decision has been made, the economist's job is to determine the price level that will be in harmony with that aim. In order to do this, an understanding of both the short-time and the long-time responses of producers and consumers to price changes must be obtained. Following the determination of the objectives and of the price levels to attain them, appropriate action must be taken by those influential in determining prices in the market.

In closing, it should be remarked that adherence to any fundamental price policy will, at times, demand a lowering as well as a raising of milk prices if the long time interests of all parties concerned are kept in mind. This lowering of prices should take place as promptly as the raising of prices and should be possible without

objection from any particular group. In practice, it would seem desirable to base price changes as much as possible upon automatic formulas rather than upon the present cumbersome and slow procedures. If those factors have been determined which influence the long-time price level and that long-time price level has been decided upon, it should be possible to take into account factors affecting short-time fluctuations in prices by means of automatic formulas. Price responses would then be prompt and in accordance with some previously determined policy.

THE EFFECT OF MILK CONTROL PROGRAMS ON COOPERATIVES

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MILK CONTROL was discussed before this association in the annual meeting of 1937 by Dr. J. M. Cassels. His summary of the problems of administration was as follows:

"Finally, we must give attention briefly to the all-important practical problems of actual administration. Even if we are agreed that there is need for a substantial measure of social control over the milk business, and even if we are agreed upon the general character of the objectives to be sought, we may still despair of the possibility of setting up any type of government agency capable of carrying out such a program successfully. Federal control has been withdrawn from 29 of the 52 markets where it has been tried. State control laws have been allowed to lapse in one-third of the states where they were originally enacted. Dissensions between state and federal authorities have frequently interfered with the development of the most satisfactory arrangements for effective control. Conflicts of economic and political interests between neighboring states have prevented the attainment of the most desirable regional understandings. Clashes between government officials and cooperative leaders have injured the morale in many instances and made enforcement doubly difficult. The resistance from opposition groups of producers and distributors has generally been fierce and uncompromising. Litigation has been continuous and enforcement by no means effective. Loopholes for evasion have been discovered by the resisters and inequitable burdens have been placed on those who conformed to the requirements of the authorities. Expenses have been high and achievements have, on the whole, fallen short of what was expected when the control agencies were first created."[1]

Cassels, in 1937, was describing milk control in its first three or four years of operation. In this discussion it will be assumed that conditions have changed materially from that time and an effort will be made to present something of a cross section of the relations of control agencies and milk cooperatives as of 1941. My presentation will deal with the situation from Ohio to the Pacific Coast. Mr. Lent, in his discussion, may want to draw some contrast be-

[1] See J. M. Cassels, Milk control, Jour. Farm Econ., February, 1938.

tween these conditions and those in the Middle Atlantic States and New England, with which he is much more familiar than I am.

One of the difficulties mentioned by Cassels was the clash between cooperative leaders and the market administrators. It seems to me that the blame for this was about equally divided between the two. There were, no doubt, in the early days, some market administrators who were not sympathetic to the cooperative movement and who would gladly have taken over all the functions of the cooperative. On the other hand, many cooperative leaders did not want to admit that in some phases of the problem the market administrator must be the boss. Sometimes the difficulty arose from the fact that the cooperative leaders asked for things that were impossible and blamed the administrator when they could not get them. It is evident that a much better understanding now exists in most areas on these matters.

In the study of this problem the opinions of producers, cooperative leaders, and research men in milk marketing were sought. In the annual meeting this year of one of the bargaining cooperatives serving the Cincinnati market, I asked the membership for a frank expression regarding the effect of federal control upon their own cooperative. They were unanimous in the opinion that it had been good. There was no evidence here of any clash between the association and the office of the market administrator. It has also been my privilege to attend the advisory council meeting of another Ohio cooperative serving the Toledo market and hear that market administration given credit for a great improvement in the market. In both of our Ohio markets under federal control there is evidence of genuine cooperation between the leadership of the cooperative movement and those in charge of administering the order. This has been helped in the Toledo market by the employment of a competent field man to work out of the office of the market administrator.

It should not be assumed that no mistakes have been made in our Ohio markets. In one instance the association was given an opportunity to establish an adequate deduction for the association when the order went into effect and producers' prices were undergoing a distinct upward swing. It failed to take advantage of the opportunity. Without adequate finance to carry a full program on the part of the cooperative, the temptation may arise to lean too heavily upon the control agency.

Indiana is now operating under state control. Those who have watched it closely tell me that it has kept in existence some cooperatives that probably would not have survived. This may or may not be a point in favor of control. Some leaders in Indiana think that cooperatives there tend to lean too heavily upon the Milk Control Board.

Michigan has had a checkered career under various forms of control. Detroit was for a while under a federal order. Several smaller cities have operated with a joint administrator. A state milk control act operated for a short time and was declared unconstitutional by the Michigan Supreme Court on the grounds that the Board was composed of men with a financial interest in the dairy industry. The cooperatives were pleased with state control and threw their influence toward the enactment of a new law. This new law was blocked by a petition for referendum. The Michigan Milk Producers Association holds the view some form of legislation is necessary to control those who will not go along in voluntary cooperation.

Contacts with the Kansas City and St. Louis markets lead me to believe that the cooperative leaders there feel that federal control has been a good thing for the cooperatives. Mr. E. W. Tiedeman, president of the Sanitary Milk Producers Association of St. Louis, said in an address before the American Institute of Cooperation in July, 1940:

"I do not believe that those people who are writing and administering the federal orders in effect today have any thought of undermining or weakening the cooperative movement. I am convinced that they are entirely sympathetic to our cause. But we would be unfaithful to our trust, we would be betraying the confidence of our own people, if we failed to see and guard against any possible weakening of the moral fibre of cooperatives as a result of governmental assistance."

California, like Michigan, has had experiences with both federal and state control. Federal control ran into difficulties over the enforcement of the Orders. The State Act provides for producers to exercise choice as to control. No program is undertaken until a petition is received representing at least 65 per cent of the producers and 65 per cent of the fluid milk used in the area. The act differs from other state laws in that it attempts specifically to protect the consumer against unfair prices. It requires that milk prices shall

not be established at levels which are higher than necessary to provide adequate prices to producers and reasonable margins to distributors.

Under this law a very significant court decision affecting cooperatives was handed down November 14, 1941. United Milk Producers of California, a non-profit marketing association, had contracted with the Borden Company on August 1, 1940, to have it process and distribute the fluid milk and cream produced by its members. The United Milk Producers, by the contract, was to receive the proceeds less all expense of operation and the compensation to the Borden Company.

The returns to the United Milk Producers on the contract did not equal the price set by state control to be paid producers. The Director of Agriculture refused to grant a license to the Borden Company and the cooperative. In a joint action they sought a writ of mandate to compel the Director to issue the licenses. The District Court of Appeal for the third appellate district refused to grant the writ and held that a cooperative must pay its producers the minimum price established by state order or cease to operate under state license.

No review of cooperative relations with government control would be complete without including Chicago. It, like several other markets, came in early for a federal order, then abandoned it and later came back to try it a second time. From all evidence, the Chicago market now is running along as smoothly as any under federal control.

No cooperative manager is in a better position to speak with authority on this subject than A. H. Lauterbach, Manager of the Pure Milk Association, because he has had experience in the control side as well as the cooperative side. Mr. Lauterbach concludes that government control cannot succeed without the aid of a strong cooperative organization. He believes that it is essential that there be a full and complete understanding between the administrator and the cooperative manager. This must be based upon a clear-cut division of functions and this is his idea of the division as given in a paper before the American Farm Bureau Federation, December 8, 1941:

"The government's functions, after proper hearings and presentation of facts, should be as follows:

"First—to write an order according to facts presented at the

hearing, which order will define sales area, define classification, and define prices to be paid for milk according to classes.

"Second—to initiate a program providing for proper reporting to the market administrator of the use of all milk, and for auditing of handlers' records to assure the accuracy of their reports.

"Third—in the case of a market-wide pool, to see that debits and credits are properly taken care of through collections and disbursements so that the pool remains solvent.

"Fourth—to see, wherever it is deemed advisable, that producers not belonging to cooperatives are given weighing and testing service. Thus a handler who does not want to play the game fairly cannot secure lower-priced milk by short weighing or testing.

"Fifth—to furnish market information which will aid the industry to continue a sound marketing program.

"The place of the cooperative is to:

"First—organize the farmer;

"Second—guarantee him a market;

"Third—guarantee his payment for his milk;

"Fourth—correct any inefficient hauling rates from the farm to the city;

"Fifth—correct inefficient receiving and cooling charges in the country;

"Sixth—handle the surplus or excess milk, if necessary;

"Seventh—build for better quality;

"Eighth—promote efficient production;

"Ninth—educate farmers to understand sound economic practices;

"Tenth—promote better fellowship in farm life;

"Eleventh—do a real job of advertising dairy products; and

"Twelfth—through the cooperation of extension people and agricultural teachers, build an intelligent generation of boys and girls to carry on a more efficient agriculture."

This is a somewhat sketchy review of the way the cooperatives are succeeding under milk control in 1941. The time has been too short to make it safe to reach any very definite conclusions. It would seem, however, that up to this point the good effects upon the cooperatives have been (1) to bring to them definite recognition of their responsibilities; (2) to make it possible to have some degree of control exercised over the trade practices and the prices paid producers by those dealers who refuse to buy from a coop-

erative; and (3) to place the cooperatives definitely upon their mettle to present the facts and look after the interests of their members in hearings before control bodies.

The dangers that beset the cooperatives under control are: (1) the temptation to lean on the market administrator and permit him to perform services that should be done by the cooperative; (2) the tendency to "pass the buck" to the control agency on issues that should be faced by the leaders themselves, and thus to break down in a measure the good will of the administrators; (3) failure to take advantage of all the opportunities to strengthen the cooperative that are afforded through government control; (4) encroachment on the field of the administrator's authority; and (5) undue resentment and criticism where decisions come slowly or are not as expected.

In a summary of these observations, I conclude that in the main there has been in the past four years a distinct improvement in the relations between cooperative leaders and state and federal administrators. There are dangers involved and many mistakes have been made. On the whole, however, it is my opinion that the net result has been a gain for the cooperatives.

SOME ECONOMIC PROBLEMS ENCOUNTERED IN MILK CONTROL ADMINISTRATION

N. J. Cladakis and Anson J. Pollard
Market Administration for New York

A MILK marketing order is an instrument devised according to law to assure farmers payment for their milk in accordance with certain standards of price and utilization. Broadly speaking, the administration of such an order consists of all the decisions, action, and effort which go into its formulation, execution, and enforcement. The day-to-day administration of a federal milk order is vested in a person known as the Market Administrator. Where there is concurrent federal and state control, as is the case in the New York Area, one person is appointed to administer both orders. In that market, he is appointed by the Secretary of Agriculture to administer the federal order, and by the State Commissioner of Agriculture to administer the state order. Since the two orders for the Metropolitan area are identical in their provisions, then for purposes of simplicity, I shall refer only to the federal order.

My experience with milk control legislation since September 1939 has been in the capacity of Market Administrator in the Chicago and New York markets. Prior to that I was with the United States Department of Agriculture, in which capacity I worked with administrative problems from the angle of enforcement, and as special agent in solving certain problems. I mention this background since it may have a bearing upon my point of view and judgment. It does seem to me that *I* as Market Administrator, and *you* as economists should view administrative problems in milk control from a broad public viewpoint rather than from any sectional or fractional point of view.

With the enactment of legislation and with favorable court decisions as a background, the success or failure of milk regulation from here on rests almost entirely on administration in the broadest sense of the term. I speak not only of the mechanics of the program but also the administrative policies, the price schedules, the restrictive privisions of one kind or another that are developed as a result of pressure groups, the testimony in public hearings, the decisions in Washington and also, of course, the action of the Administrator himself. Those who believe in milk control should bear in mind that

the program and its administration must result in public good and have public approval if it is to last.

Having set forth this broad generalization, let me discuss in more specific terms a market administrator's role in milk control administration and particularly its economic aspects.

First a word as to the size of the job. The New York order regulates the purchase of milk by handlers of nearly 500 country plants scattered over a radius of about 500 miles to the west and north of New York City. These plants must make monthly reports on purchases of milk and on its utilization in seven different classes. The reports must be verified periodically. The information on purchases and utilization of milk must be compiled monthly. The prices and values are computed for each class of milk and for each handler. A market pool is made up each month and proper adjustments are made between the obligations of each handler and the value of such milk at the pool price to his producers. The milk shed itself is divided into 50 ten-mile zones with price adjustments for each zone. Approximately five hundred million pounds of milk are delivered monthly from sixty thousand farms. The checking of the producer payrolls is one of the jobs of the market administrator's office. This milk represents a value of 10 to 13 million dollars per month as it is received at country plants. One might carry the description much farther, but perhaps this is sufficient to show the magnitude of the ordinary administrative tasks which are involved. Let us now turn to certain other problems more closely related to your interests.

While the Administrator is not charged with responsibility for the formulation of general policy or of drafting a milk control order, he is nevertheless required to make decisions that do have far reaching economic effect. Such situations arise more often than any one could wish. They stem from the fact that the economists and marketing specialists who formulate the orders can not foresee all the results and the ingenious methods of evasion some handlers will use. Nor is it fair to expect a marketing order to be a perfect instrument, void of loopholes, and yet flexible enough to cover all new conditions which might arise.

Thus it becomes necessary for the Administrator to interpret the order in such a way as to carry out its intent although the point at issue may not be covered in specific language. It is always his moral duty, moreover, to point out in public hearings or to those charged

with the formulation of the order, any basic weaknesses that should be changed. Administrative interpretations of the order should be based upon their economic, their legal, and their public aspects.

Many troublesome situations have confronted the market administrator in the course of administration of the federal marketing orders that govern the milk markets of Chicago and New York. It is likely that such situations arise more frequently in large markets than in small ones simply because of their size and complexity. Milk price control is, moreover, a relatively new type of public regulation.

One of the most troublesome features of the New York order from an administrative point of view has been the provision allowing handlers diversion payments. These are, as the term implies, money paid for diverting milk from one plant to another for processing or manufacture. The payments are made from money that would otherwise be returned to milk producers. Specifically, payments are made on milk that is moved from a country plant equipped only for receiving whole milk to a manufacturing plant where it is made into any of several milk products. The operator of the first plant, the one which receives the milk from producers, receives the money paid for diversion.

The payment consists of two parts, a receiving allowance and a hauling allowance. The receiving allowance, amounting at present to seventeen cents a hundred weight is intended to cover the cost of handling the milk at the first plant where it is received from producers. The hauling allowance is intended to cover the cost of hauling the milk to the second plant, and is scaled according to the distance the milk travels between plants. At present, the total diversion payments average about twenty-three cents a hundredweight on all diverted milk and the monthly total has ranged from $200,000 to $700,000 per month.

This brief explanation of diversion payments is believed necessary since the New York market is the only one under federal control in which such payments are made. Without attempting to pass upon their economic merit I shall describe some of the administrative problems that have resulted.

First, in the beginning no limits were placed upon the hauling distance for which diversion payments could be paid and some milk was transported many needless miles with resulting losses to farmers.

Second, the diversion payments made it more profitable to divert milk to a second plant rather than to process or manufacture it in the first plant. Several primary plants therefore proceeded to remove equipment so as to qualify for payments.

Third, some handlers claimed that separate buildings on the same piece of property constituted separate plants and made extensive claims for diversion payments.

Fourth, some handlers proceeded to build partitions within buildings and then claimed that each part of the building constituted a separate plant. Milk was transferred from one part of the building to another, or from one building to another through pipes and hence the term "pipe-line diversions."

The administrator's problem might seem simple. To me the issue was clear. But remember, it had previously been ruled that pipe-line diversions both in "inter and intra building commerce" was legitimate and proper and entitled to diversion payments. Remember also that hundreds of thousands of dollars were involved in the administrative decision. Even after two years of time some of the early decisions have not been made final.

In the meantime, the federal order has been amended expressly to incorporate in it the administrative interpretation that ruled out pipe-line diversions. The Administrator has been given the specific power to determine what buildings and equipment constitute a milk plant. At the same time, diversion payments were eliminated on milk that moved less than one-half mile, and a maximum limit of 65 miles was placed on the hauling distance on which diversion payments could be made.

At one time diversion payments on milk diverted for manufacture into cheese were the source of a second difficult economic problem. Cheese prices were advancing rapidly, and cheese makers could see prospects of large profits by making cheese in one month and selling it in another. To add to the situation, the cheese quotation on which the New York class price for milk made into cheese was based *did not* reflect the true value of the cheese and appeared to be about two cents a pound too low. Cheese makers, therefore, not only were anxious to get milk for cheese, but also were willing to pay substantial premiums over the class price. These premiums on top of the diversion payments made the cheese factory a profitable market for the operator of a country receiving plant.

Those fluid milk distributors who did not maintain and operate

country milk plants were faced with the prospect of paying premiums of forty to fifty cents a hundredweight on milk in order to match the combined return of diversion payments and cheese premiums. A scarcity of fluid milk in the sales area appeared in the making at the very same time that milk production was nearing its peak.

The Administrator sent a letter to all handlers in which he warned that diversion payments would be denied to handlers who refused to sell fluid milk at reasonable prices to New York City dealers. The Administrator stated in the letter that the order is designed to assure consumers an adequate supply of fluid milk at a reasonable return to producers.

Did the Administrator actually have the power to deny diversion claims to handlers who had refused to ship fluid milk? He felt that the welfare of the market should guide his decision. In any event, the warning was never translated into action. It proved sufficient to relieve the situation. And again, when the order was amended a few months later, a provision was inserted arming the Administrator explicitly with the power to deny diversion payments upon the refusal of a handler to ship fluid milk.

One of the early problems encountered in enforcing the federal order in Chicago arose from the presence in the market of bootlegged milk—that is, fluid milk that did not come from sources approved by a health authority of the Chicago area. Like the Chicago order, the one for New York names only the milk that is delivered to approved plants.

Distributors handling unapproved milk had a decided advantage over distributors of approved and price-controlled milk. The lack of success that would come in the wake of a control system in such circumstances does not need to be particularized.

It might be argued that the order was not concerned with bootlegged milk. It could be argued, more reasonably perhaps, that the primary responsibility for keeping unapproved milk out of the market rested with the health authorities.

The Administrator approached the problem directly. He took the position that he could not assume that the Secretary of Agriculture intended to exempt from control any fluid milk sold in Chicago simply because it might have been sold in violation of the health code. The Administrator ruled that the dealers handling bootlegged milk must pay into the equalization pool the difference be-

tween the lowest class price and the fluid price. This step was based on the obvious assumption that bootlegged milk forced approved milk out of the fluid category and into the low-priced surplus classes with a resulting loss to producers.

Distributors of bootlegged milk soon discovered that the price advantage which had made it profitable for them to violate the health code had disappeared. In fact, unless they had purchased their unapproved supplies originally at less than the lowest class price in the Chicago order, a doubtful possibility, they were being forced to pay more than their legitimate competitors.

Subsequent amendments to the Chicago order, however, put the question beyond controversy. The power of the Administrator was expressly broadened to enable him to assess charges against dealers in bootlegged milk. Unapproved milk has been driven from the Chicago market more effectively than could have been done by health authorities alone.

It is not often that the Administrator is confronted with acute economic problems similar to the pipeline diversions, a threatening scarcity of fluid milk, or the competition of bootlegged milk. It is, therefore, a rare occasion when he must make such bold use of his administrative power to achieve an economic end.

But in addition to such striking remedies to specific problems, the Administrator of a milk marketing order is in a commanding position to furnish information—information that will have a long range economic effect. In view of the vast collection of records in any Administrator's office, the long time problems of milk marketing are susceptible to analytical study and interpretation.

I believe my own record shows that I think economists have an important contribution to make to sound administration of milk orders. From the beginning of my service as Market Administrator, I have employed economists on my staff and sought the advice and counsel of others. I have further made it a policy to bring factual data and their economic interpretation to bear upon problems and issues involved in milk control. The Market Administrator's *Reporter* at Chicago and the *Bulletin* for the New York market are evidence of this point of view. Although economists have a large contribution to make to sound milk control administration, their view is not the only one that must be considered—assuming, of course, that economists are of one mind. The legal, accounting, and public relation angles, as well as that all-

inclusive public welfare concept, must be duly considered. Happily these views are not always in conflict with one another.

There probably has never been assembled in one place so much current information on milk marketing in the New York milk shed as is in the files of the New York Administrator's office. Such data, as have been available in the past, have been compiled from government records of shipments tabulated from voluntary reports of handlers, statistics confined to individual states, and the cooperative spirit of a few handlers interested in improving the industry as a whole. But today all the handlers regulated by the order must report each month the receipts of milk from producers, the payment of producers, the exact butterfat test of all their milk, and its actual utilization. Moreover, these reports are verified by audit.

This information is assembled purely for administrative purposes and for general information on the operation of the order. Statistics of a general nature on the classification and value of milk are published currently. Such a mass of information, however, enables the Administrator to make a lasting contribution to a sound and permanent marketing program by going beyond routine reports and making analyses of specific subjects. At present, in the New York office, detailed studies are being made of the utilization of milk, the movement of milk between plants, the transportation rates, and the sale of milk and cream in outside markets. Plans are underway for studies of storage cream, variations in deliveries by producers, hauling rates from farm to plant, and the credit facilities provided by monthly milk checks. It is believed that studies of this type will, over a period of time, contribute greatly to the improvement and practical administration of milk control.

MILK CONTROL IN CANADA

J. Peter Nadeau
Wartime Prices and Trade Board for Canada

PUBLIC CONTROL of the fluid milk industry in Canada is relatively new. It started when the general price index and prices paid to farmers were at a low level and when prices paid to farmers were out of line with the general price level. Milk prices followed the trend of all farm prices and the price of milk to farmers was drastically low and out of line with the cost of production of this essential food. The purchasing power of the average consumer was low. Milk sales were at a low level and a large volume of surplus milk was shipped to our most important markets, thus reducing still further the average returns to producers.

Reviewing our Dominion from east to west, the following control was organized in the years 1931 to 1935.

Prince Edward Island

The Milk and Cream Producer, Distributor, Vendor Protective Board, as it is called, was organized. This Board has very limited powers and is made up of a representative of each of the following: Provincial Dairy Department; the distributors; the producers; the vendors; and the municipal council, acting for the consumers. Prices are established only for the city of Charlottetown which is the capital, and are arrived at by agreement between all parties concerned.

Nova Scotia

The Dairy Products Arbitration Board of three members has also limited powers and all decisions rendered are subject to approval of the provincial cabinet of ministers. Prices are established for seven of eight cities after due consideration and study have been given to requests made by all parties concerned.

New Brunswick

The Dairy Products Commission of three members, when organized, obtained broader powers than the two previously mentioned. It now establishes prices for milk and cream on some 17 markets of the Province. The orders of this Board become law when published in the *Royal Provincial Gazette*. Two methods of pay-

ment are permissible, and markets are classified according to the method used. Under Plan A, milk is paid for on the basis of butter fat test and weight; under Plan B milk is purchased and paid for on gallon measure. On some markets both plans are used, Plan B being used by small distributors and milk vendors.

Quebec

The Quebec Dairy Industry Commission also of three members was first organized in 1934. In 1940 it was re-organized, and now has five members. This change brought in a representative of the milk distributors and left the majority of the Commission as neutral. This is the only place in Canada where distributors are directly represented in the milk control body.

This Board establishes milk prices on some 50 markets. No cream prices are established. The powers of the Board are broad and its decisions become law when published in the *Provincial Gazette.* The outstanding feature of the work of this Commission as compared to others in Canada has been the strict control of resale prices.

The similar features of the milk control bodies of Quebec and of the Maritime Provinces are that:

1. No surplus milk price is allowed. All milk purchased must be paid for on the basis of the established prices.

2. Prices are established by the public control bodies, with the exception of P.E.I. where agreements are sanctioned.

Ontario

The Ontario Milk Control Board, organized in 1934, sanctions agreements on milk and cream prices between producers and distributors on some 80 markets. The outstanding feature of this Board is that:

1. It has always sanctioned agreements and in but few cases has it established prices by arbitration. The Board has power to arbitrate when an agreement is impossible.

2. A formula price is established by this Board for milk not sold as fluid, but manufactured into various dairy products. This formula price applies to at least 15% of the quota milk supplied by each producer—85% being paid the fluid milk price.

The powers of this Board are comparable to those of the Quebec Commission; and this Board has given a lot of attention to trade

practices and good understanding between farmers and distributors.

The Prairie Provinces (Manitoba, Saskatchewan, and Alberta)

The Manitoba Milk Control Board and the Saskatchewan Milk Control Board are quite similar to those of Quebec and Ontario. The headquarters of the Manitoba Board are in Winnipeg, and of the Saskatchewan Board, in Regina. These Boards establish milk prices, as the Quebec Board does; but admit the use of a surplus formula price as in Ontario, where the price fixing is carried out by agreements.

In Alberta, milk is considered a public utility and the control of prices of this commodity comes under the Jurisdiction of the Chairman of the Board of public utilities, Edmonton, Alberta. In this province, milk prices are established by public hearings at which producers, consumers, and distributors are asked to present their views and requests. The Chairman then takes the decisions in the light of the information so obtained. Prices are established both for fluid milk and for surplus or manufactured milk.

British Columbia

In this province, some work has been done in the field of milk control, but it has shown little effect on the situation of milk prices and market organizations of this product. At the present moment, we have no provincial control body in operation; and the present prices, which are lower than in comparable cities, are the result of agreements between producers and distributors. The present situation concerning milk control is not clearly defined in this province, but indications are that a complete study will be needed in the very near future before a decision can be taken.

The work done by these control bodies in the past ten years has been such that today in all important markets of Canada milk control is no longer an emergency measure, but milk control is established and will remain as the medium through which problems can be solved, agreements can be reached, and information obtained and compiled. Milk Control Boards are still needed to maintain order in marketing and to protect the honest producers and distributors. Milk Control bodies in Canada are not as yet working in their final form. This result has not as yet been reached; but important changes are taking place, and, today, every milk control

organization of Canada is studying and adopting more stable measures of work. Some of these can be outlined as follows:

1. Application of a compulsory minimum of accounting to all milk distributors.
2. Collection of accounting and facts from producer associations.
3. Compilation of more complete data concerning all phases of the milk industry.
4. Application of economic study and analysis to all phases and problems of the milk industry.

These and other new measures adopted have thrown more light on the field of milk control; but they have also brought new problems with which the control bodies have to cope, and which are demanding more permanent solutions.

Dr. Hopper was kind enough to let me have the answers received from an inquiry recently sent to all Milk Boards in Canada. All of the problems menioned by these bodies may be summed up under the headings of judicial, economic, and administrative. The judicial problems are chiefly concerned with enforcement, price cutting and court rulings. The administrative problems seem to revolve around the maintenance of fixed retail prices and the problems derived therefrom. The administration problems facing the control bodies are being passed on more and more to the industry itself. Ground has been laid for a more complete cooperation in the field of milk control.

DISCUSSION BY FRANK B. LENT

Dairymen's League Cooperative Association

Basically, the original function of the cooperative was to eliminate competition between farmers so as to increase their prices. The original plan for doing this was to get all the farmers into the cooperative. Breakdown of this method came with the depression. There was too much outside, uncontrolled milk. Acting in the interest of producers, the cooperatives called for government help to control the pricing of the outside milk. Statutes were enacted and administered. After some set-backs, this trend again seems to be growing. Did the cooperatives thus sow the seeds of their own destruction? The result in England, where this movement started in 1931, is shown by the following quotation:

"Turning to the marketing societies, pride of place has always been given to those handling milk and milk produce, and these have still a slightly larger turnover than any other single group. They are, none the less, the only unsuccessful group in the movement. The number of societies fell from 35 to 30, 5 societies did no business, membership fell by 18 per cent,

capital by 13 per cent, and turnover by 9 per cent. Fifteen societies made a net profit and 15 a loss, but there was a net loss of 1 per cent over the whole group.

"Such occurrences in an otherwise flourishing movement require explanation, but the explanation is fortunately by no means difficult. When the societies are studied individually, it becomes apparent that the small cheese societies did well, as did most of the rather small group engaged in retailing or the sale of Grade A.A. T.T. milk. It was the wholesalers of liquid milk representing the bulk of the turnover and much of the former prosperity of the group which showed trading losses and a heavy decline in turnover. A moment's reflection on the provisions of the Milk Marketing Scheme (same as our government orders) make the situation clear. The milk wholesalers were, in effect, bargaining organizations. Now that the functions of bargaining have been taken over by the Milk Marketing Board, and all prices fixed, the societies have become mere transport agencies operating solely on the margin allowed for 'transit' risks, which, though it may be and probably is ample for an organization which does its own retailing or manufacturing, has proved inadequate where 'transit' alone is the function of the organization. Developments which have favoured the small cheese factory and left the producer of graded milk untouched have left the wholesaling society isolated. It is all the harder since such societies might well claim that they have pointed the way to the Milk Marketing Board which has superseded them. The problem before them is a hard one. They have a good record in the past and do not desire to wind up. They hold considerable farmers' capital. On the other hand, to launch into some fresh business—the manufacture of packet cheese, for instance, or of condensed milk—is a risk which they may hesitate to take."[1]

Whether the situation in England under which this development took place is analogous to our conditions is a matter of considerable doubt. However, the startling result there lends weight to the question of the necessity for and possibility of the continued existence of cooperatives under government control. As an equally important corollary there arises at the same time the question of the advisability of the continuance of government control programs if they endanger cooperatives.

The latter question is becoming very prominent in the minds of many cooperative leaders and members in the New York milk shed. It is almost universally agreed that the Federal order here has been a great success in the upward stabilization of producer prices. Still, the apparent contradiction of the continued existence of cooperatives during government performance of the price fixing function constantly bothers many dairymen who believe that the cooperative is the only long-time protection for the producer.

However, in the opinion of a great many in this territory, there is a solution for this problem. The first step is to get a true picture of the proper part to be played in the program by the cooperative on one hand and the regulatory authority on the other. It is wrong to consider merely the phy-

[1] Year book on cooperatives, 1937, Horace Plunkett Foundation.

sical functions of the cooperative, as did the English analyst. The correct view is that the cooperative is the motive power behind the government program. The regulation should be treated, considered, operated, and explained by both the government and the farm leaders as merely an implement in carrying through the organic pricing functions of the cooperative. This is the true essence of the matter. It is as Judge Cardozo described a tuberculosis eradication program, in the following words:

"The safest thing was to leave the choice to the enlightened self-interest of those within the industry. They would inspect their own herds, not intermittently and casually, but with the solicitude of ownership. Better than mere officials, they would know what should be done. Some protection, however, there would have to be against dissent within the group, the factious opposition of an intransigent minority. . . . Small use would there be in stimulating the many within a township to a care of the public health, if one or a few wise acres or obstructionists could make the labor vain. More and more, in its social engineering, the law is looking to cooperative effort by those within an industry as a force for social good. It is harnessing the power that is latent within groups as it is harnessing the power in wind and fall and stream. Conspicuously is it doing this in its dealings with agricultural producers, spread often over wide areas, and thus deficient in cohesion, but yielding up new energies when functioning together. We see this in the very statutes, already quoted, with their attempt to check tuberculosis by cooperative effort. We see it in the cooperative marketing associations which have made such headway of recent years in this State and many others, associations with privileges and powers peculiar to themselves."

Considered in this light, the apparent conflict disappears. Each branch does its share. Success for all results. On the other hand, any failure by either the government or the administrator to treat the program in this manner immediately leads to disruption.

Dr. McBride quotes Mr. Lauterbach to the effect that government control cannot succeed without the aid of strong cooperatives. This is only too true, but sometimes it seems to be lost sight of by government administration. The idea crops up occasionally that producers can be dealt with directly. A well established price control comes to be thought of by administrative authorities as "our" order or "my" order. The cooperation of producer leaders, who initiated the program, in continuing to educate producers as to its merits, seems no longer necessary. "We" can do the whole job.

When such a state of mind develops, changes begin to appear in provisions made in the program for the protection of cooperatives. These seem relatively minor at first and attempts are made to sell them to producers as great benefits. The resultant detriments to producers' *organizations* and in turn to *member producers* are passed over. As an example of this, there is a headline which appeared in the *Bulletin* published by the office of our administrator last June. Referring to the recently reduced cooperative payments, the headline says "*Dairy Farmers* Gain $30,000 From Reduction in Coop. Payments." This was changed by September to read more correctly

as follows: "Reduction in Coop. Payments Saves Producer *Fund* $22,000." But there still remained an inference that taking part of the service payments away from the cooperatives was a good thing and without cost to any dairyman.

Perhaps I have overemphasized the publicity, but it is difficult for me to be objective. Really much more important to our cooperative movement as previously mentioned, are, changes in the order itself. Some of these, such as the July first amendment raising the excess cream pricing, depressed our pool. Also it caused losses to the Dairymen's League. For many years both before and under the order it has handled the cream needed for balancing the New York City market and fluctuating remainders resulting therefrom. This necessitated the marketing of such varying left-overs sporadically in many open cream markets for various uses. This operation is difficult in any event because it is not financed, as it should be, by all producers for the market. But when "outside" cream, as we call it, became prohibitively priced on July first it put the League "right over the barrel." We either had to sell cream for butter at smaller loss to our producers, but a lower return to the pool, or sell outside cream at a greater loss to our members but a higher return to the pool. I do not wish to imply that the mistake in the prohibitive pricing of outside cream was deliberately aimed at us. Nevertheless, the drafters must have known we were largely engaged in this class of operation. The immediate mistake in the cream pricing could have been avoided by a change providing for a tentative proposal and exceptions; and it is understood that this procedure has been corrected. Also, we have hopes that the order provisions on these classes will be changed before another period of flush production, along with other changes to bring about more proper distribution of the expense of our balancing operations.

Once more it should be emphasized: first that there is a real place for orders as implements to the price stabilization activities of organized producers; secondly, that *only* when *so* conceived and *so* operated will orders continue to function; thirdly that any attempt to regulate without producer-organization support will only result in chaos and confusion; and lastly, that there is only one way to insure the maintenance of producer organizations for the purpose of securing such merited support, and that is to decisively recognize cooperatives' financial and operating problems under regulation and make adequate provision therefor in the terms and administration of the regulations.

The will of Congress, as set forth in the Agricultural Adjustment Act and found by the Supreme Court to be still in effect under the Marketing Agreement Act is to "accord such recognition and encouragement to producer-owned and producer-controlled cooperative associations as will be in harmony with the policy toward cooperative associations set forth in existing Acts of Congress, . . ." and the policy of the New York State Legislature is to "promote, foster and encourage . . . cooperative associations" under price orders. An all-around, sincere attempt to carry out these mandates will be of lasting benefit to farmers of this country.

PROBLEMS OF GRADUATE STUDENTS IN THE RURAL SOCIAL SCIENCES

THE STUDENT COMMITTEE

FOLLOWING last year's successful introduction of such a Session, the annual meetings of the American Farm Economic Association again included a session devoted to the problems of graduate students in the rural social sciences. A group of graduate students, professors, and administrators met, and with Dr. B. H. Hibbard, Professor Emeritus at the University of Wisconsin, as chairman, discussed questions of special interest to graduate students.

Although several problems were raised and discussed, both during and after the session, most of the discussion period was devoted to two topics—an analysis of the attributes of a good teacher at the graduate level, and the means by which graduate students might find a place to use their training most effectively during the war.

The ability to stimulate independent and original thinking on the part of his students was considered the most essential quality of a teacher at the graduate level. The means of accomplishing this end were generally recognized to be difficult to define, and were considered to vary widely between individuals according to their special abilities and experiences. It was suggested, also, that the curriculum at the graduate level should usually contain a minimum of course work of a routine nature, and that seminar courses that require the student to exercise a considerable amount of initiative were very desirable. The ability of a student to apply what he has learned logically to a new situation was recognized to be an essential objective of all graduate instruction and goal for all graduate students.

The problem of how graduate students in agricultural economics might best serve their country during the war was a topic in which all graduate students present were very much interested. Many specific questions relative to the present and future demand for men with special training in agricultural economics were raised by graduate students. A representative of the United States Civil Service Commission and several heads of departments of agricultural economics, as well as graduate students, participated in the discussion of means by which an individual student might find a place in which his special training could be applied.

It was pointed out that the creation and expansion of several governmental agencies as a result of the war have increased the demand for economists. At the time of the discussion, there was an especially active demand for men who were acquainted with the economic aspects of certain industries, and for men who had studied the economies of foreign countries. It was suggested that, because of the widespread demand for economists, anyone who was interested and qualified should register his qualifications by taking the current open, continuous examination for agricultural economists. Applications now on file with the Commission were said to be continuously reexamined to find persons qualified for special jobs. It was emphasized that the Civil Service Commission was in no position to request deferment for men who were certified, and that any such action must be by the employing agency.

In order to meet the demand for men in certain fields it has been necessary to draw on lists established for related types of occupations. In so doing, some men have been certified for positions in this other field of a lower grade than that for which they were qualified in their special field. Any person with a rating, it was stated, might limit the types of positions and/or agencies for which he wishes to be considered by exercising his privilege of stating such a choice. Furthermore, the applicant could always refuse an appointment when certified.

For those with special training who are interested in government service, but who do not have a Civil Service rating, the National Roster of Scientific and Specialized Personnel was set up in Washingto, D. C., so that their names and qualifications might be placed on file.

It was reported that some graduate students who had already started work on their doctor's theses had arranged with the R.O.T.C. officers at their institution to obtain contracts to take advanced military training at the institution they were attending. Such an arrangement terminates, it was stated, at the end of the two-year training period with a commission in the Army. In the meantime, these men hope they will be able to complete their doctorates and that their graduate training may qualify them for certain branches of service in which the work they have done as graduate students may be useful. It was also suggested that commissions in the supply branches of the Navy may be available partly on a professional basis to some men who are trained in certain branches of agricultural economics.

Important opportunities for service, it was pointed out, would continue to exist in many places outside the federal services. It was said that while the number of students in universities and colleges was reduced during World War I, the number of staff members was also lessened, and at the same time the number of problems created by the war were multiplied.

It was generally recognized that this question would have to be answered by each student individually, but all students present appeared to be very much interested in learning of the several possibilities so that they might make as intelligent a decision as possible.

Several other questions and topics were suggested for discussion by the graduate students, but lack of time prevented consideration of them by the entire group. The following were some of these:

1. How specialized should the curriculum of a graduate student be to best qualify for later work? How do employers look at this problem?

2. What place does or should economic theory occupy in a graduate student's curriculum?

3. What place does or should mathematics and statistical theory occupy in a graduate student's curriculum?

4. Should there be more fellowships and fewer assistantships to encourage full-time study during a part of the period of graduate work?

5. How best can a graduate student plan to attend more than one institution in the amount of time usually devoted to graduate study? Are adequate facilities and opportunities available to most graduate students at present to attend different schools?

6. From the viewpoint of the graduate students concerned, would not uniformity in respect to the policy of answering applications for fellowships and assistantships be desirable?

The Student Committee

Ivan R. Bierly, Cornell University
Elmo Jackson, Harvard University
Ernest P. Heiby, Ohio State University
Philip M. Raup, University of Wisconsin
Roland G. Nelson, Pennsylvania State College
R. S. Bylin, University of California
Byron R. Bookhout, Purdue University
A. H. Harrington, University of Illinois

THIRTY-SECOND ANNUAL MEETING OF THE AMERICAN FARM ECONOMIC ASSOCIATION

The thirty-second annual meeting of the American Farm Economic Association was held in New York City, Commodore Hotel, December 27, 28, 29, and 30, 1941.

Report of the President

The Association's activities for the past year are a matter of record, and need not be detailed here. I shall therefore relate these few remarks to some of the problems which may warrant the attention of the Association and its officers in the year that lies ahead.

The pattern of procedure in Association activities has become standardized, perhaps too much so. At any rate there may be need for it to take new forms in the coming year. It is conceivable that the holding of a meeting of this kind may be considered inadvisable a year from now. If so, we may need to rely more heavily on the Journal as a means for the exchange of ideas and the results of researches.

These are dynamic times. Association procedure should strike a constructive balance between the values in tried methods and the possibilities in new developments. Academic research has for the most part been leisurely and highly individualistic. In recent years, however, research in government agencies has become much more highly organized and coordinated. Much of it has related to immediate operating problems. During the recent past there has been, however, much discussion of what was then called "post defense problems." Serious study along these lines is likely to be crowded more and more into the background as war efforts intensify. This raises a question as to whether there should be more effort to bring to bear on some of the major problems, especially those of post-war readjustment, resources that exist outside the government agencies. In some measure these resources could also be used more fully even on immediate problems, through farming out studies which need not be done in Washington.

We have before us such problems as those of how to relate our agricultural economy to those of Canada, South America, Europe and Asia; of achieving a less uneasy balance between agricultural and non-agricultural pursuits; and of alternatives to a continuous or recurring population pressure in agriculture. But these are large problems not well suited to individual research. The Association

might well consider whether it can aid in coordinating and stimulating more effective work on researches of larger scope and more fundamental significance than those which our members are now carrying on. This comment is not meant as a belittling of present activities or of individual researches. It is rather a recognition of the fact that the problems themselves have grown in scale and that we may need other approaches to them.

In more usual times highly individualized research has much to be said for it. It is out of such individual and unstandardized studies that much of our intellectual progress arises. Now however, we are heavily involved in a program of national planning, first for war and secondly for post-war. Plans may be wise or unwise, but in any event, at the national and international level, they must be large in scale and usually will call for considerable numbers of people working within the framework of a coordinated scheme. We cannot afford to lose the war. Neither can we afford to win the war again and lose the peace. The best brains, the best leadership, and the best organization that we can mobilize are needed in dealing with the gigantic problems that lie before us. Many individual preferences for the present at least, should be relegated to the background. Our greatest needs are for leadership, vision, and coordination of effort. It is to be hoped that the Federal agencies will consider seriously the opportunities for constructive contributions from workers not directly in the government service as well as of their own people, and will recognize both the national scope of the problems and the need for facilitating the use of all the nation's resources in meeting them.

I for one, would like to see this Association explore the possibilities of larger scale, more fundamental studies, perhaps through a small but carefully selected committee. The conclusions of such a committee might be negative or it might find some other agency better suited to the task of guidance and stimulation. At least, however, the problem would not have been ignored.

Referring now to some of the longer standing problems of the Association, it seems to me that its Committee activities have not at any time been notably effective. Yet there are problems on which special committees might conceivably make a significant contribution. This is unlikely to occur with our present form of organization. The president's attention is too much absorbed with the planning and development of the program, and his period of responsibility is too short. The American Statistical Association is proposing this year an arrangement that might well be studied by this Associa-

tion. It is in brief that a man elected as president shall serve for one year as president with the responsibility chiefly for planning the program, and one year as chairman of the board with more general responsibility for the affairs of the Association. This offers some promise of more effective committee work. At any rate it is an interesting experiment.

The American Economic Association has proposed this year a new procedure for the election of the president. This too might well be studied with interest by our Association.

In conclusion, may I express my keen appreciation of the wholehearted cooperation of the members of the Association in carrying through the program for this year. It has been a difficult and trying time. Excuses and failures to carry through with commitments might well have been expected. There have been surprisingly few cases of that kind, and the Association owes a debt of gratitude to the many who have made their contributions at very real sacrifices in time and effort.

(signed) M. R. BENEDICT, *President*

Report accepted as read.

Report of the Secretary-Treasurer

Membership: Added effort has been exerted to maintain membership numbers. As is to be expected, foreign membership is declining. In 1940 the foreign membership was reduced by 32 as compared to the previous year. In 1941 the reduction was 25. Japan has by far the largest number of members of any foreign nation. There are now 37 members in that country. All these will have to be dropped at the beginning of the coming year.

While domestic memberships have been increased, the additions have not been sufficient to offset the foreign losses. The peak in membership numbers was reached in 1939 when it stood at 1269. The 1941 figure is 1255. The following table contains the record for the past three years, classified by groups.

Membership Groups	*1939*	*1940*	*1941*
Individuals (U. S.)	829	845	879
Individuals (Foreign)	60	53	40
Libraries and Firms (U. S.)	214	209	207
Libraries and Firms (Foreign)	166	141	129
Totals	1269	1248	1255

It is hoped that all members of the Association will see their way clear to place the Association in a favorable light before younger agricultural economists.

The JOURNAL: The JOURNAL will cost more to publish next year. Paper costs during the past year have risen to a point which increased the paper stock in the JOURNAL by $50.00 per year. We should not be surprised if trends in this direction continue. In regard to the prospects for changes in the quality of the paper going into the JOURNAL, I quote from a letter from our publisher:

"The government has ordered a reduction of ten per cent in the amount of chlorine used for bleaching purposes in the manufacture of pulp and paper, and there is likely to be further reduction as time goes on. The effect of this is going to be an inevitable change in the color of paper. If the raw materials are subjected to less bleaching, the color of the finished product will be darker and there will be greater degrees of variation from lot to lot. This means simply that standards which held good in recent years are going to be lowered."

Finances: Operating income for the fiscal year 1941 increased slightly but expenses increased more than operating income. Non-operating income, however, was substantially above that of a year ago resulting in a net balance of $3,395.88 as compared to $3,180.70 for 1940.

The operating statement for 1941 as compared to 1940, follows:

OPERATING STATEMENT
THE AMERICAN FARM ECONOMIC ASSOCIATION
Year Ending November 29, 1941
(Compared with 1940)

			1941	1940
Operating Income				
Receipts from dues		$ 5,886.57		
Back Numbers sold		260.32		
Reprints sold		198.65		
Advertising sold		25.00		
			$ 6,370.54	$ 6,311.69
Operating Expense				
JOURNAL OF FARM ECONOMICS				
Vol. XXIII, 4 issues	$ 3,209.06			
Vol. XXIII, 4 reprints	448.66			
Annual Meeting Expense				
Annual Meeting, 1940	240.53			
Annual Meeting, 1941	38.23			
Ballots, Envelopes	19.50			
		$ 3,955.98		
Back Numbers Purchased	15.00			
Postage	123.35			
Office Supplies	25.75			
Editorial Assistance	253.40			
Miscellaneous	81.44			
		498.94		
			4,454.92	4,325.12

Excess, Receipts above Operating Expense		$ 1,915.62	$ 1,986.57
Plus Non-Operating Income			
Dividends, Stocks	$ 1,439.66		
Interest, Savings Account	40.60		
		1,480.26	1,194.13
Total Excess, Receipts above Expenses		$ 3,395.88	$ 3,180.70

FINANCIAL STATEMENT

THE AMERICAN FARM ECONOMIC ASSOCIATION
December 1, 1941

Assets			
Cash, bank balance	$ 1,340.29		
Stocks and Bonds, cost*	28,320.82		
Savings Account	2,061.18		
		$31,722.29	$28,326.41
Proprietary Interest			
Net worth December 1, 1940	$28,326.41		
Plus net returns for year			
Operating	1,915.62		
Non-operating	1,480.26		
		$31,722.29	$28,326.41

* Market value November 29, 1941—$22,198.50.

A detailed report on the Association's security holdings has been made by the Investment Policy Committee to the Executive Committee. It is important to point out here, that the market value of our stocks and bonds at the end of the present fiscal year—$22,198.50—is $6,122.32 less than their cost. The yield on these securities is the highest in the Association's history. The stocks, which represent the largest proportion of the investments, show a return based on cost, of 5.78 per cent.

Respectfully submitted,
(signed) ASHER HOBSON, *Secretary-Treasurer*

Report accepted as read.

Report of the Auditor

In accordance with the request of the President of this Association, I have examined the accounts and records of the Secretary-Treasurer of the American Farm Economic Association for the year ending November 29, 1941. I hereby certify that all the entries in the accounts were checked against supporting vouchers and found to be correct. The assets of the Association were checked by an examination of the bank statements and by an inventory of the securities owned by the Association.

I certify that the accounts of the Association have been carefully and neatly kept, and that the financial statement of the Secretary reflects the transactions and financial situation of this Association accurately. The records and accounts are in excellent condition and can be easily verified. The Association is indebted to those in charge of the work for the splendid manner in which these records are being kept.

Respectfully submitted,
(signed) WALTER H. EBLING, *Auditor*

Report accepted as read.

Report of the Editor

During the year 1941, Volume XXIII of the JOURNAL OF FARM ECONOMICS was issued. It contains four numbers. The Proceedings, issued in February, includes the annual reports and the papers presented at the New Orleans meetings of the American Farm Economic Association. The subsequent numbers were issued in May, August, and November. Volume XXIII has 954 pages (exclusive of advertising materials).

The Proceedings Number of 398 pages includes 25 major articles, 22 discussions, reports of the annual meeting of the association, 7 reviews, and a list of 29 publications received.

The May, August, and November numbers carry as follows: 28 major articles, 18 notes, 35 reviews, 61 publications received, 3 memorials, 15 pages of news items, 6 pages of preliminary program for the annual meeting, and 9 pages of index for Volume XXIII; in addition 16 pages of advertising with economic journals and related subjects.

During the year December 1, 1940, to December 12, 1941, the editor received 71 manuscripts. Forty-six articles were accepted for publication; 15 were withdrawn or found not suitable for publication in the JOURNAL. Twenty-five were returned for revision, 19 were revised and re-submitted to the editor. No action was taken on 5 manuscripts.

This fall I asked your president, Professor M. R. Benedict, to relieve me of the task of editor of the JOURNAL. I have enjoyed the privilege of this office for four years. It has been a rich, fine experience. I have learned much about you and our association. Our membership has vitality. I have found an abundance of goodwill, a deep interest in professional progress and growth of our field, and a

willingness of individuals to give generously of their time to help develop a more scholarly and useful literature. We have, however, a long way to go. Our articles and books are in the main quite amateur. We are too busy and often too close to action to permit the deeper attributes of scholarship to develop. I have no doubt though that as we mature our contributions will become increasingly more significant. There is every reason to have high expectations.

The editing of the JOURNAL has not been an individual undertaking. Quite the contrary, it has been a cooperative enterprise. Whatever has been accomplished must be ascribed to many jointly. Professors W. G. Murray and J. A. Hopkins have often assumed more responsibility of editing the JOURNAL than have I. Last year while I was in South America, they handled the August issue in its entirety. Professor Hopkins assumed full burden of the section on Book Reviews throughout; Professor Murray that of the section on Notes. The heaviest and in many ways the most exacting work has been borne by Mrs. Florence Nicholls, the assistant editor. Her painstaking efforts, her practiced hand and her intelligent insight have given the JOURNAL style, tone and quality in its technical features. Her work and guidance in this sphere has been invaluable these past four years.

The Journal owes much also to the members of the editorial council. They have not read many manuscripts. Their task has been more important—that of formulating policies to guide and direct the affairs of the JOURNAL.

I wish the incoming editor every success.

(signed) T. W. SCHULTZ, *Editor*

Report accepted as read.

Report of the Election Tellers

We, the undersigned election tellers advise that we have tabulated the ballots cast for the election of the Association's officers for the year 1942. The results are as follows:

President	G. S. Wehrwein
First Vice President	R. R. Renne
Second Vice President	E. B. Hill
Secretary-Treasurer	Asher Hobson

(signed) ERIC ENGLUND
H. E. ERDMAN, Tellers

Report of the Committee on Definitions of Terms in Farm Management

Mr. President and members of the Association, you may recall that your committee on definitions of terms in farm management submitted its report at last year's annual meeting of the Association. This report was received and published in the February issue of the JOURNAL.

Such expressed views and opinions as have been received since that time indicate that, though there are numerous individual differences of opinion among members of the Association, the committee report approximates the best statement that the committee is able to devise at this time.

The committee recognizes that the development of terminology is a dynamic and evolutionary process. The proposed definitions represent the stage now reached in the thinking of members of this committee. It is not expected that these will in every instance prove acceptable to all farm management workers and in all circumstances. The aim is rather to make progress in uniformity of usage and precision of terms.

Where these terms are given other meanings, the committee suggests that users may call attention to such differences. Progress towards uniformity of usage can probably best be facilitated if members of the Association, who differ with these definitions or who have improvements to suggest, will present their suggestions as notes for the JOURNAL. In this way, a widely acceptable usage can grow in scope and refinement without undue rigidity.

Since this committee has accomplished the purpose for which it was formed, we recommend that it be discharged.

Respectfully submitted,

(signed) H. M. DIXON, *Chairman*
C. W. CRICKMAN, *Secretary*
G. W. FORSTER
P. S. WILLIAMSON
R. H. WILCOX
O. C. STINE
D. CURTIS MUMFORD
D. HOWARD DOANE

Report accepted by the Association.

Report of the Committee on Recruiting and Training Personnel in Agricultural Economics

This committee came into existence late in 1936 and has been continued each year since. In its initial report at the 1936 meeting of the Association the committee recommended that a survey be made of the existing conditions affecting personnel in agricultural economics. The committee continued to work on this proposal and, with the cooperation of a similar committee of the Social Science Research Council, and the active support of the American Council on Education, the study was made in 1940. The needed funds were supplied by the General Education Board.

The survey was made by Professor T. W. Schultz of Iowa State College. A brief report of the results of the survey was made by Professor Schultz at the annual luncheon of the Association one year ago. Since then the report has been printed in book form and distributed to interested persons by the American Council on Education.

During the past year the committee has attempted to bring the problems brought out by this survey to the attention of those in position to take action. Arrangements were made for Professor Schultz to discuss the results of the survey before an interested section of the Land Grant College Association at its annual meeting in November 1941. In other ways the report has been brought to the attention of those in position to act upon the recommendations growing out of the survey.

Conditions have not been favorable for material improvement in the conditions which were the immediate cause of the appointment of this committee in 1936. However, the committee believes that worth while results have been accomplished. More people are aware of the problems involved and of the action needed to correct existing difficulties. Needed work has been done which should result in more favorable consideration of the problems of recruiting and training personnel in agricultural economics.

The outlook for the coming year is not encouraging. Undoubtedly the need for men who are well trained in agricultural economics will be far greater than the supply of such men. Replacement of men who may leave the staffs of teaching and research departments and institutions will be difficult. The events of the years intervening since this committee was first brought into existence have tended to accentuate the problem rather than to correct it.

In view of these developments it seems advisable that provision be made for continuance of the work begun by this committee either by continuance of such a committee or by other means. It is recommended that the work be continued along the lines outlined in previous reports of this committee.

Respectfully submitted,
(signed) C. O. BRANNEN
F. F. LININGER
T. W. SCHULTZ
E. C. YOUNG
F. A. WAUGH
W. E. GRIMES, *Chairman*

Report accepted as read.

Other Business

The incoming President and the Executive Committee are asked to consider the advisability of appointing a committee to study and report upon improved techniques in conducting the round table method of discussion.

The Secretary is instructed to express the appreciation of the Association to the Chairman and members of the Joint Committee on Local Arrangements, to Professor Spencer, our member on that Committee for his fine contributions to the successful arrangement of the meetings, to Professor Morgan whose attention and efforts made possible the "Smoker"—a de.ightful social event; and to the Management of the Commodore Hotel for its excellent accommodations placed at the disposal of the Association.

The meeting voted unanimously the expression of its deep appreciation to Professor T. W. Schultz, the retiring editor, for his four years of untiring service to the Association.

Executive Committee Action

Meeting of December 28, 1941

The Committee expressed a preference for holding the 1942 annual meetings in Chicago.

The President is an ex-officio member of the editorial council.

The Treasurer is authorized to defray the cost of the "Smoker" to be held on December 28, 1941.

Professor H. B. Price is appointed editor of the JOURNAL OF FARM ECONOMICS for the year 1942.

The invitation to the American Farm Economic Association to affiliate with the American Society of Agricultural Sciences was laid on the table.

It is recommended that the President consider the establishment of a committee to examine the possibility of closer collaboration with agricultural economists in Latin America.

The Committee on Recruiting and Training Personnel in Agricultural Economics is instructed to study and report upon methods used in soliciting and appointing scholars, fellows, and student assistants.

A Junior Membership is established on an experimental basis under regulations to be prescribed by the Secretary. It is open to graduate students only. Annual dues are $3.00 per year.

It is recommended that the President appoint a committee to consider the advisability of giving special recognition by the Association to individuals who have made outstanding contributions in the field of agricultural economics.

In order to furnish transfer officers of corporations with the necessary evidence that the Secretary-Treasurer is authorized to transfer securities in the name of the Association, the following resolution is adopted.

"RESOLVED, that the Secretary-Treasurer who is also Chairman of the Investment Policy Committee, be and is hereby authorized and empowered, for, and in the name and on behalf of this Association to take any and all such steps, and to do any and all such things, as may be necessary, required and appropriate for, or in connection with, the purchase, acquisition, acceptance, handling, pledging, sale, or other disposition of stocks, bonds, and other securities belonging to the Association or pertaining to its business, including the execution, and delivery for and in the name and on behalf of the Association, of any and all endorsements, transfers and assignments of certificates of stock, bonds or other securities standing in the name of this Association, either for the purpose of sale or transfer, and all such other steps and action as may be necessary or proper in connection herewith."

PUBLICATIONS RECEIVED

Agresti, Olivia Rossetti. *David Lubin, a Study in Practical Idealism.* Berkeley, Calif. Univ. of California Press. 1941. 372 pp. $2.50.

Andrews, Horace J., and Willard S. Bromley. *Trends in Land Use in Northern Michigan.* Washington, D. C. Charles Lathrop Pack Forestry Foundation. 1941. 45 pp.

Angell, James W. *Investment and Business Cycles.* New York. McGraw-Hill Book Co. 1941. 363 pp. $3.50.

Bartlett, R. W. *The Price of Milk.* Danville, Ill. Interstate Printers, 1941. 171 pp. $1.75.

Bennett, M. K. *Wheat in National Diets, Wheat Studies, Vol. XVIII, No. 2., Food Research Institute.* Stanford Univ., Calif. 1941. 37–75 pp. $1.00.

International Labour Office. *Wartime Developments in Government-Employer-Worker Collaboration.* Montreal, Canada. 1941. 152 pp. $1.00.

International Labour Office, Edward J. Phelan, Acting Director. *The I.L.O. and Reconstruction.* Montreal, Canada. 1941. 112 pp. 50¢.

Kyrk, Hazel, and others, Consumer Purchases Study. *Family Expenditures for Housing and Household Operation, Five Regions, Urban and Village Series.* U. S. Dept. of Agri., Misc. Pub. 432. 1941. 244 pp. 25¢

Murray, William G. *Agricultural Finance.* Ames, Iowa. Iowa State College Press. 1941. 328 pp. $3.25.

Nicholls, William H. *Imperfect Competition within Agricultural Industries.* Ames, Iowa. Iowa State College Press. 1941. 384 pp. $3.75.

Ostrolenk, Bernhard. *Economic Geography.* Chicago. Richard D. Irwin, Inc. 1941. 804 pp. $4.00.

Tax Institute. *Tax Barriers to Trade.* Philadelphia, Pa. Tax Institute, Univ. of Pennsylvania. 1941. 344 pp. $2.50.

Taylor, Alonzo E. *Why Enrichment of Flour? Wheat Studies, Food Research Institute, Vol. XVIII, No. 3.* Stanford University, Calif. 1941. 77–108 pp. 75¢.

U. S. Federal Reserve System, Board of Governors. *Banking Studies.* Washington, D. C. 1941. 496 pp. $1.50.

Wallis, W. Allen, and Geoffrey H. Moore. *A Significance Test for Time Series, Technical Paper 1.* New York. National Bureau of Economic Research. 1941. 59 pp. 50¢.

REVIEWS

Agricultural Price Analysis. Geoffrey S. Shepherd. Ames, Iowa. Iowa State College Press, 1941. Pp. 402. $3.75.

Persons working in several branches of Agricultural Economics should find parts of this book of special interest. It relates to prices, marketing, and some governmental programs involving price control. The author has written in a clear and interesting style.

The book should be of interest also as a contribution to the small but growing list of books which demonstrate a scientific approach to economic problems. A factual approach is indicated by the presence of seventy-nine figures and thirty-one tables. The author is to be commended for having some research material to present, and for presenting it in detail rather than by vague generalizations.

Economic theory is listed as one of the component elements of agricultural price analysis. Its use appears frequently, but most commonly on topics where statistical research is lacking, such as in the last part of the book.

The first two chapters contain an excellent discussion serving to orient the reader for the remainder of the book. The first chapter is introductory, and the second traces the evolution of markets and market price-making.

Chapters three to twelve apply the concept of a "perfect market" This is an unusual and interesting approach whereby the author views variations in price from the standpoints of differences in time, place, and form of each commodity.

The last half of the book comes under the author's heading of "Analysis of Price-determining Forces." He discusses first the measurement of elasticities of demand and supply, and their changes. This section emphasizes methods of research. The remainder of the book deals mostly with programs designed to control or influence agricultural prices, such as production control, price stabilization programs, the "Stamp Plan," plans for pricing fluid milk for city markets, and marketing agreements.

The book is entitled *Agricultural Price Analysis*, but many parts of it could as well be described as a book on marketing. For instance the following topics are discussed at length,—evolution of markets, hedging and futures trading, the centralized vs. decentralized market, the margin between farm and retail prices, the nature of market demand and ways of measuring it, and various marketing

schemes based on group action. The relationship of agricultural price analysis to marketing is not indicated clearly either by the title of the book or by the discussion in the preliminary chapters. On page four, agricultural marketing is listed as one of the three basic elements that make up agricultural price analysis, but on page five agricultural price analysis is listed as one of three distinct elements of agricultural marketing. The author might well have indicated more clearly how price analysis is a necessary tool for the investigation of marketing problems in a price economy; how the margins of distribution agencies are a cause of change in the price of the commodity and at the same time a means of measuring the importance of the marketing services that have been performed.

A few questions may come to the minds of readers relative to the scope or treatment of subject matter in the book:—

(1) The book would seem to be most useful as a source of reference readings and as a supplementary text rather than as a complete text for a comprehensive course in either prices or marketing. The discussion of many subjects covered in the book are helpful, but other highly important ones for such courses are not included. For a course in prices, the book would seem deficient in the attention given to various aspects of the general price level (other than its use as a deflator in deriving demand curves), index numbers of prices, money systems and measures of value, and the characteristics of change in prices of different goods and services. For a course in marketing, the book would seem deficient in such things as the costs of performing various services, the conditions and commodities on which investment in the services of marketing are justified, the agencies of marketing, types of business organization as related to marketing efficiency, and characteristics of the ultimate market for different goods and services.

(2) The author's treatment of price variations relative to time seemed much more complete than those dealing with place and form. Place was dealt with largely at one point in the distribution process. Form dealt mostly with prices for various grades of a few products, rather than with any of the other changes in form such as processing.

(3) Commodities used for illustration and as the basis for generalizations about prices and marketing were principally grains, hogs and cattle, with which the author seems most familiar. It is important to consider the results of research on other commodities

for verification or contradiction of the general principles derived.

(4) At one point it seemed clear what the author means by *demand*. "The demand for potatoes, then, is the whole series of prices and quantities represented by the demand curve in Figure 39, Chapter 13." The figure referred to shows potato production (United States, in bushels) in relation to prices that have been deflated by the general price level. Yet at another point he says: "After World War I, economists became acutely conscious of the changes in demand associated with inflation and deflation." It is not always clear whether the author retained throughout the book this first concept of demand.

(5) Some will question the belief that most demand curves for agricultural products are characteristically straight lines on arithmetic paper. Confirming evidence is not shown.

(6) A problem needing much more attention is that of deriving demand curves from historical data on commodities having prices largely of the "administered" type.

(7) Some will fail to share the author's confidence in, and enthusiasm for, the graphic method of multiple correlation for problems of price analysis. He limits its usefulness to conditions where the number of items do not exceed twenty or thirty, where the number of variables are only three or four, and where the correlation is high. Perhaps a fourth should be added,—i.e., where interserial association between variables is not extensive. Under these limitations, the usefulness of the method would seem to be occasional rather than widespread.

(8) The author seems to condemn "price discrimination" of the type involved in fluid milk markets, and to bemoan lack of consumer representation to the extent that he suggests the need for setting up "a unified efficiently operated public utility system of milk distribution." Where is the evidence that such plans will result in efficiency? Others will wonder why the author failed to point out the need for representation of consumers, present and future tax payers, and producers of other commodities when other plans equally discriminatory are drafted and administered. Such plans include production control, corn loans, and the Stamp Plan. Yet in the last chapter of the book the author raises a very significant question about these various devices for setting prices by means of monopoly or discriminatory action, " . . . the inevitable results would seem to be persistent unemployment, persistent idle capi-

tal, persistent idle land, and persistent idle entrepreneurship."

To raise the preceding questions is not for the purpose of questioning the author's worthy attempt to summarize and interpret research evidence now available, but rather to endorse his plea for more research on many questions related to agricultural price analysis and marketing.

F. A. HARPER

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Tax Barriers to Trade, Tax Institute, Univ. of Pennsylvania, Philadelphia, 1941. Pp. 344. $2.50.

Tax Barriers to Trade is a collection of twenty-nine papers delivered at a Symposium conducted by the Tax Institute in Chicago, December 2 and 3, 1940.

The papers present divergent points of view "so that interested citizens can appraise for themselves the elements of the situation." The organization of the symposium is logical and the speakers stick to their particular topics so that there is less repetition than is ordinarily found in a collection of papers on a single subject. The speakers include representatives of special interests involved, as well as economists, lawyers, and accountants representing no particular group. The planning committees include Professors Shoup and Leland.

The book is divided into six parts. An introductory section is followed by *Highway Trade Barriers* and *Commodity Trade Barriers* —the two parts that are of the most direct interest to agricultural economists. As is proper for a book intended for laymen, some of the excellent material from *Barriers to Internal Trade*[1] is included, although this removes some of the novelty for agricultural economists familiar with the previous study. The scope of the Symposium, however, is much broader than the Department of Agriculture report. Special interests present their viewpoints. A research director of the Association of American Railroads points out that motor transportation is increasing much faster than railroad business and adds that . . . if, in fact there are barriers working against interstate commerce in this country, it is obvious from the results that they are working more grieviously against traffic moving by rail than they are against truck traffic (p. 66). The Secretary of the Kansas Port of Entry Board says that it is the

[1] A Special Report to the Secretary of Agriculture by B.A.E., U.S.D.A., 1939.

sincere belief of the port-of-entry officials that our ports are not in any wise a barrier to trade (p. 75). Part Four discusses *Marketing Trade Barriers* with special emphasis on chain store taxes. Part Five is concerned with *Tax Barriers to Trade* and Part Six is *What Can be Done about Trade Barriers.*

Although trade barriers are not wholly new, they first began to appear in large numbers in the early thirties. Their growth appears to have been arrested during the past two years, but the trend has not been definitely reversed. Some gains have been made on the legislative side—in 1939 scarcely any new trade barriers were erected and a few existing laws were repealed—but on the judicial front, legislation obstructing interstate trade has been sanctioned for new reasons. The Supreme Court has upheld a number of state laws which interfere with interstate commerce on the grounds that Congress and not the Court should designate the extent to which interstate commerce may be protected from state action. In the absence of any Congressional action, states can pass laws that constitute formidable barriers to trade. In the special case of alcoholic beverages, the Twenty-first Amendment has been interpreted so that the states have the right to regulate (including the right to prohibit) interstate shipments. Sales taxes on goods moving across state boundaries have been held legal, if the vendor comes within the judrisdiction of the state. The more drastic use tax has been held valid on goods shipped by a mail order house into use tax states. The general effect of the use tax is to reduce the differential advantage created by the sales tax, as in the above instance, but it sets up new trade barriers.

L. JAY ATKINSON

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Economic Geography, Bernhard Ostrolenk. Chicago, Richard D. Irwin, Inc., 1941. Pp. 804. $4.00.

If it is trite to commend an elementary text by saying that it serves to bring together otherwise scattered materials, it is perhaps because the purpose of most textbooks is just that. To be sure, a few of them make history because they present a novel approach or because they treat a field not elsewhere summarized, but these are relatively rare instances. Professor Ostrolenk's *Economic Geography* is not in the exceptional class.

The book represents what is included in economic geography

courses at the City College of New York. Whether it is adopted at other colleges depends upon the extent to which others accept the weighting and organization of the subject-matter, the reliability of the factual materials, and the author's interpretative statements.

Since economic geography is defined by Professor Ostrolenk as "the study of the way man makes a living by utilizing his physical environment," there is only a vague basis for sorting available materials and no clear reason for the relative importance assigned to the different phases of the subject-matter. The author says that only those phases are treated that are important or opportune, but this is hardly an adequate explanation. Thus, for any given resource or raw material there may or may not be in this book a discussion of world or national geologic occurrence, labor unions, price policies, corporate structure, product utilization, world trade, tariffs, technical production processes, transportation, government aid or control, production economics, or industrial history. Specifically, for instance, while the theme of the book is resource "conservation," and while 165 pages are devoted to agriculture and include many details of apparently insignificant items, only three sentences are given to the Soil Conservation Service program, and one of them is erroneous.

The general organization of the book as a whole is reasonable although the grouping of resources as power resources, metals and minerals, and agriculture forces forestry into a final division called "movement and conservation." The internal organization of some of the chapters is excellent; of others it is obviously poor. Thus, in one chapter there is a section headed, "A.A.A. of 1938" and four pages later another section is entitled, "A.A.A. (1938)."

Stemming again from the definition of the field, the data tend to become encyclopedic in spite of the author's statement that such is not his intent. As a result, there is ample opportunity for errors of fact, and a number of them appear. In a two-page explanation of the rectangular survey system, there are four misstatements. While these two pages are not representative, there are numerous other errors, even though they appear less intensively. Many of them may be eliminated if the book is ever reprinted.

On the whole, the author's interpretative remarks reflect no new insights. Most of them are repetitions of the points made in the government publications of the past decade. The book would have been immensely improved had the author winnowed the wheat

from the chaff in these pronouncements. His failure to do so is illustrated, for example, in his references to forest policy, farm tenancy, and multiple-purpose dams.

The most pervasive interpretative concept of the book is "conservation." That Professor Ostrolenk does not clarify the issue of "conservation" needs to be mentioned, even though it is probably no great criticism in view of the general confusion regarding this term. On alternate pages, we seem to have ample supplies of resources and to be faced with serious problems if we do not "conserve" them. The concept of "conservation" as the simple elimination of physical waste is both accepted and rejected, and often the reader cannot be sure if the author means physical waste or economic inefficiency.

If there is any concept of "conservation" that is used in the book more than another it is a differentiation between "true" costs and "pecuniary" costs. Something of the same idea has been moving toward the surface in recent discussions of "conservation," and seems to be basically an approximation of Pigou's concept of private versus social net product. But it should be obvious that we need to refine and sharpen such concepts and not merely make them more vague. Unfortunately, the book under review leans in the latter direction.

LEONARD A. SALTER, JR.

University of Wisconsin

The Soils That Support Us, Charles E. Kellogg, New York, The Macmillan Company. 1941. Pp. 370. $3.50.

The subtitle of this book is revealing, it is "An introduction to the study of soils and their use by men." As an introduction to soils you are led into seemingly simple relationships that gradually become more complex and detailed but which never become a maze in which the layman is lost. After reading the book I had the feeling that I could take a soil profile and from it deduce the geology of the area, its climate and vegetative cover; the profile appears as the reflection of a landscape. This effect is produced by a combination of simplicity of language and organization of materials.

Chapter I is an introduction in which philosophy, history and a description of plant growth are blended to show their relationships. Chapter 2 describes rocks, their chemical constituents, their formation, breakdown and movement by glaciers, water and wind.

Chapter 3 shows the influence of plants and climate upon the basic building materials and how soils grow. Chapter 4 describes the parts of a soil, its texture, structure, porosity and profile, and the relationship of these factors to plant growth and use. There is an excellent diagram (p. 66) showing the relationship of the profiles of six of the great soil groups to various important substances such as clay, organic matter, acids and bases. Chapter 5 describes the relationship of water to soils both in their formation and use by man, and Chapter 6 outlines the great soil groups and tells you why they are different.

Following these six chapters which give the reader a broad background of soil science are four chapters (7 to 10) dealing in more detail with the soils of the grasslands, the desert, the temperate forested lands and the warm and tropical forested lands. Here the discussions include the suitability of these soils to specific crops and their susceptibility to erosion.

In the second phase of the book, we are partly prepared for and introduced to the third part which deals with the relationships of man to the soil in eight chapters dealing with practical problems as indicated by the Chapter headings: Men Use the Soil, Soils for Different Crops, Plowing and Digging, Fertilizers and Lime, Control of Water on the Soil, When Do Soils "Wear Out," Planning the Use of the Soil, and Soil and Our Future. It is in these chapters that the philosophy of the author is most clearly revealed, as for example when he states: "But the biggest problem is not the soil directly but the people on the soil . . . . The emphasis must always be on the people who care for the land, not directly on the land" (p. 203). It is this social attitude that leads Dr. Kellogg to see our problem of soil erosion in terms of deep maladjustments of men to the soil resulting from increasing commercialization, land values, taxes, the pressure of needs for immediate income, insecurity of tenure and ignorance. Commercialization has led to over-specialization in many areas and crops have not been properly related to soils so that depletion and erosion have resulted.

Planning, to Dr. Kellogg, is essentially the use of science to guide and harmonize natural and cultural processes and must come from discussion and agreement between citizens, experts and administrators. It also must take into account the multitudinous ends of the people and should not be dominated by "single purpose" individuals (p. 278). He then lists eleven important considerations

that influence the use of the soil and these range all the way from defense, tenure and tariffs to electric power, research and zoning! This indicates a broad social point of view and the need for coordination, but it minimizes the important role of "single purpose" individuals in making the people conscious of specific national problems and initiating action to alleviate them. Social action agencies must direct their programs to as specific ends as possible in order to evaluate progress and develop specific techniques and means of attaining the end. This is particularly true of such widely divergent but inter-related ends as security of occupancy, stabilization of farm prices and income, and conservation. Social planning in its broadest connotations must understand these inter-relationships and see that individual action agencies do not conflict; the danger lies in conflicts between agencies which expand their programs so that they over-lap other agencies with the resulting duplication, self interest conflicts and social inefficiency. Such problems are not solved by eliminating the enthusiast but by developing an efficient central coordinating agency that will define ends and control conflicting means.

The importance of soil types in determining land use patterns, social institutions, and even ideas is emphasized throughout the book and maladjustments in land use appear to result from the mobility of a culture to a new soil. This concept of soil type determinism conflicts directly with the concept that erosion is a result of rural poverty and maladjusted institutions; extreme erosion prevails in Korea after centuries of occupation by the same people because of the growing pressure of population upon the resources. On page 153 Dr. Kellogg states, "The struggle between the North and South during the Civil War was marked quite closely by the boundary line between the two soil regions," and on page 180 he states, "But the idea that white people can only live in the tropics without working has been quite well destroyed. The idea was convenient for those who wanted to make slaves out of the natives; and it still is." The most extreme statement, however, occurs on page 157 in reference to the Gray-Brown Podzolic region where it is stated, "People were independent. Economic cooperation was not so necessary here as in the Chernozem region. This attitude of independence, on the part of both farmers and business men, came to be known by political scientists as *laissez-faire*." No one would deny that soil type is an important factor limiting the den-

sity of population and the methods of farming under any given culture and state of the arts. Slavery (as Dr. Kellogg himself points out) is a result of other factors, so too are marriage systems, urbanization, trade, our growing commercialization, and our philosophies of political and economic relationships. Cooperation was known and practiced long before we settled our chernozem soils, and *laissez-faire* was a reaction against feudalism and rigid social control of trade as it had developed on those same soils. Whether you agree or disagree with the point of view of the author, the discussion is always stimulating; social scientists dealing with land use problems will appreciate the emphasis on social and economic factors as developed by a soil scientist although they may question the emphasis on soil type as a causative factor.

In addition to the text are four valuable appendices which include soil mapping, a description of the great soil groups, a bibliography which is broad and annotated in an excellent manner (to which should be added H. H. Bennett's book *Soil Conservation*), and a glossary. The book is well illustrated with excellent photographs, figures, and maps.

ARTHUR C. BUNCE

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Forgotten People, George I. Sanchez, The University of New Mexico Press, Albuquerque, New Mexico. 1940. Pp. 98. $2.00.

This book contains a study of the New Mexicans, some of their characteristics and predicaments and some suggested remedies. The setting of the book is in New Mexico with communities in Taos County used as typical New Mexican communities. The term New Mexican as used by the author refers to those people so frequently called Spanish-American, Mexican, or Spanish-speaking people of New Mexico.

The ancestors of these people came into the area which is now New Mexico more than three hundred years ago. Far removed from the currents of civilization, living a relatively simple life with few wants, the New Mexicans are living in a world more or less of their own. These people were under Spanish, then Mexican, and finally United States jurisdiction. Many of the New Mexicans were not greatly interested in who ruled over them because they lived their own quiet lives, farming lands that had been granted them by the Spanish king and contributing little toward financial support of the

government. After New Mexico became one of the United States, these people were gradually stripped of a large part of their lands and livestock because "They have no tradition of competition, of education, or of Western civilization beyond the sixteenth century."

Dr. Sanchez feels that the greatest handicap for these people is their lack of education. In Taos County, ninety-six per cent of the school census is made up of children with some Spanish blood. Salvation for the New Mexicans must be through some form of education. The present school system teaches all elementary courses in English, yet the majority of children are reared in homes where Spanish is the spoken language. Thus, the children are unable to understand the teacher and a language which is foreign to them must be used, at least in school, if they continue their formal education. So, children quit school without becoming familiar enough with English for it to be of any value to them in learning new things about agriculture, health and government. But in these communities of New Mexicans, "Literacy is of questionable value when there is nothing to read, little to write, and no incentive to do either."

In the past, these people made their livelihood by tilling the soil and grazing a few livestock. Today many of them are still trying to earn a living by this same system or from what little land they can obtain. The author truly states the plight of the New Mexican —"He did not, and still does not, know the nature of his problems nor the techniques for their solution." These people all want more land, but with the methods of agricultural production that most of them use, more land would mean only a greater economic loss to them and to society.

The last part of the book, "Government and Public Service," suggests ways in which the public agencies may assist these people. The first and second steps are government land purchases and controlled land use and management. These two steps would make land available to the New Mexicans and at the same time would promote desirable use of the land. The remaining steps can be grouped under education. "Midst the wreckage of his economy and his culture, and unprepared for the new order of things, he is pathetic in his hopelessness—a stranger in his own home." The author feels that the condition of the New Mexican is comparable to that of the American Indians on reservations.

Demonstrations of good farming would encourage these people

to improve their condition if the returns would make it possible for them to obtain that much desired possession—land. This is difficult because a large tract of land is needed to permit a family to earn a livelihood under the semi-arid conditions of Taos County. In many areas, the taxes discourage individuals from acquiring land, and it frequently becomes tax delinquent. Government owned and controlled land for these New Mexicans would make it possible to conserve and save the land resources but it would not mean that these people would be better able to live in a competitive society.

The author of "Forgotten People" expects too much of education in an agricultural area that is too thickly populated in relation to the agricultural resources. Education including training may make it possible for these people to increase their incomes but wouldn't it also increase their desire for more expensive things of life that they do not have; such as, automobiles, refrigerators and modern homes?

In 1940, the United States Census reported a value of farm land and buildings per capita of $149 for Taos County and $296 for the State of New Mexico. Training these people to use modern methods of farming may make it possible for them to earn a livelihood by farming in areas where more resources are available per capita. This may have been what the author had in mind when he stated that the New Mexican must "have the ability to compete for a living wherever he may go." No mention was made of moving a part of these people to a less densely populated area, but if enough of the New Mexicans were moved to other areas, the solutions suggested by Dr. Sanchez would permit those remaining to earn a living from the land.

HARRY G. SITLER

Bureau of Agricultural Economics

A Significance Test for Time Series, W. Allen Wallis and Geoffrey H. Moore, National Bureau of Economic Research, Technical Paper 1, September, 1941. Pp. xii, 59. 50 cents.

This paper is important to agricultural statisticians for two reasons: first, because it presents a simple test for the occurrence of systematic tendencies related to sequence or order in time series; and second, because it inaugurates a group of technical papers to be published by the National Bureau of Economic Research. The principal test suggested is based on the frequency distribution of se-

quences of like signs in the first differences of the time series. The theoretical distribution of these runs in random data have been empirically estimated, but probably exactly enough for all practical purposes, and these values tabled. Counting the number of runs in the three classes of one, two, and more than two similar signs in the first differences of the series and comparing this frequency with the theoretical by means of the Chi-square test, an appropriate adjustment enables the probability of the appearance of such a grouping of runs in random data to be read from the table of Chi-square. Such a test is useful in protecting the investigator from drawing unwarranted conclusions of many kinds from his data and may well become part of the standard equipment of agricultural statisticians. It should not be overlooked, however, that the randomness of events in time does not preclude their analysis on other bases that may be significant. For example, these events may have a high association with other preceding events which are themselves randomly distributed through time. Thus the procedures, while useful, apply to only a certain sector of the problems of time series analysis.

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